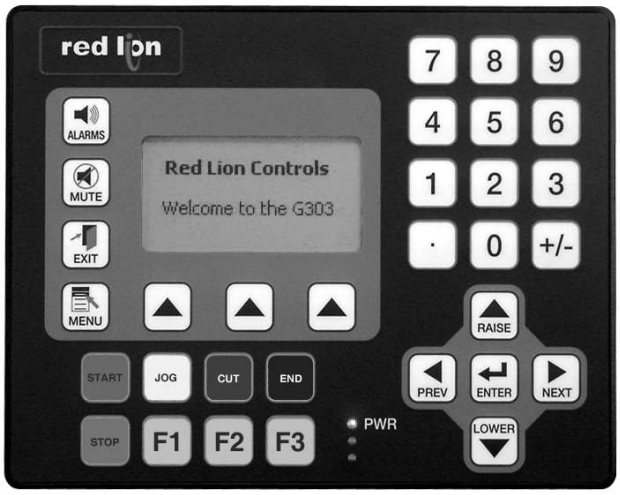
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839
www.redlion.net

Bulletin No. G303-K
Drawing No. LP0561
Released 10/07

MODEL G303 - GRAPHIC LCD OPERATOR INTERFACE TERMINALS



- *CONFIGURED USING CRIMSON SOFTWARE (VERSION 2.0 OR LATER)*
- *UP TO 5 RS-232/422/485 COMMUNICATIONS PORTS (2 RS-232 AND 1 RS-422/485 ON BOARD, 1 RS-232 AND 1 RS422/485 ON OPTIONAL COMMUNICATIONS CARD)*
- *10 BASE T/100 BASE-TX ETHERNET PORT TO NETWORK UNITS AND HOST WEB PAGES*
- *USB PORT TO DOWNLOAD THE UNIT'S CONFIGURATION FROM A PC OR FOR DATA TRANSFERS TO A PC*
- *UNIT'S CONFIGURATION IS STORED IN NON-VOLATILE MEMORY (4 MBYTE FLASH)*
- *COMPACTFLASH® SOCKET TO INCREASE MEMORY CAPACITY*
- *3.2-INCH 128X64 PIXEL LCD WITH YELLOW LED BACKLIGHT, ABLE TO SUPPORT TEXT AND SIMPLE GRAPHICS*
- *OUTDOOR UNIT WITH UV RATED OVERLAY AVAILABLE*
- *32 BUTTON KEYPAD WITH USER IDENTIFIABLE KEYS, NAVIGATIONAL KEYS, NUMERIC KEYS, KEYS FOR ON-SCREEN MENUS, AND OTHER VARIOUS KEYS.*
- *THREE FRONT PANEL LEDS*
- *POWER UNIT FROM 24 VDC ±20% SUPPLY*

c UL us LISTED 63YN
LABORATORY EQUIPMENT

FOR USE IN HAZARDOUS LOCATIONS:
Class I, Division 2, Groups A, B, C, and D
Class II, Division 2, Groups F and G
Class III, Division 2

CE

GENERAL DESCRIPTION

The G303 Operator Interface Terminal combines unique capabilities normally expected from high-end units with a very affordable price. It is built around a high performance core with integrated functionality. This core allows the G303 to perform many of the normal features of the Paradigm range of Operator Interfaces while improving and adding new features.

The G303 is able to communicate with many different types of hardware using high-speed RS232/422/485 communications ports and Ethernet 10 Base T/100 Base-TX communications. In addition, the G303 features USB for fast downloads of configuration files and access to trending and data logging. A CompactFlash socket is provided so that Flash cards can be used to collect your trending and data logging information as well as to store larger configuration files.

In addition to accessing and controlling of external resources, the G303 allows a user to easily view and enter information. The unit uses a Liquid Crystal Display (LCD) module, which is easily readable in both indoor and outdoor applications. Users can enter data through the front panel 32-button keypad that has user identifiable keys.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2/CLASS II, DIVISION 2/CLASS III, DIVISION 2

CAUTION: Risk of Danger.
Read complete instructions prior to installation and operation of the unit.

CompactFlash is a registered trademark of CompactFlash Association.

CONTENTS OF PACKAGE

- G303 Operator Interface.
- Panel gasket.
- Two user legendable key sheets.
- Template for panel cutout.
- Hardware packet for mounting unit into panel.
- Terminal Block for connecting power.

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
G303	Operator Interface for indoor applications only, textured finish with embossed keys	G303M000
	Operator Interface for indoor or outdoor applications, glossy finish with UV rated overlay (keys are not embossed)	G303S000
G3CF	64 MB CompactFlash Card [5]	G3CF064M
	256 MB CompactFlash Card [5]	G3CF256M
	512 MB CompactFlash Card [5]	G3CF512M
G3RS	RS232/485 Optional Communication Card	G3RS0000
G3CN	CANopen Optional Communication Card	G3CN0000
G3PBDP	Profibus DP Optional Communication Card	G3PBDP00
PSDR7	DIN Rail Power Supply	PSDR7000
SFCRM2	Crimson 2.0 [2]	SFCRM200
CBL	RS-232 Programming Cable	CBLPROG0
	USB Cable	CBLUSB00
	Communications Cables [1]	CBLxxxxx
DR	DIN Rail Mountable Adapter Products [3]	DRxxxxxx
	Replacement Battery [4]	BNL20000
	Key Strip Paper	LBAFLM02
G3FILM	Protective Films	G3FILM03

[1] Contact your Red Lion distributor or visit our website for complete selection.
[2] Use this part number to purchase Crimson on CD with a printed manual, USB cable, and RS-232 cable. Otherwise, download from www.redlion.net.
[3] Red Lion offers RJ modular jack adapters. Refer to the DR literature for complete details.
[4] Battery type is lithium coin type CR2025.
[5] Industrial grade two million write cycles.

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com

SPECIFICATIONS

1. **POWER REQUIREMENTS**:
   +24 VDC ±20% @ 9.5 W maximum. Must use Class 2 or SELV rated power supply.
   Power connection via removable three position terminal block.
   Notes:
   1. The front panel PWR LED indicates power.
   2. The G303's circuit common is not connected to the enclosure of the unit. See "Connecting to Earth Ground" in the section "Installing and Powering the G303".
2. **BATTERY**: Lithium coin cell. Typical lifetime of 10 years.
3. **DISPLAY**: 3.2" 128 x 64 pixel FSTN LCD with yellow LED backlight for characters and simple graphics applications.
4. **32-KEY KEYPAD**: 8 user legendable keys, 5 navigational keys, 10+2 numeric keys, 4 dedicated keys, and 3 soft keys for on-screen menus.
5. **MEMORY**:
   On Board User Memory: 4 Mbyte of onboard non-volatile Flash memory.
   Memory Card: CompactFlash Type II slot for Type I and Type II CompactFlash cards.
6. **COMMUNICATIONS**:
   USB Port: Adheres to USB specification 1.1. Device only using Type B connection.

> ⚠ WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

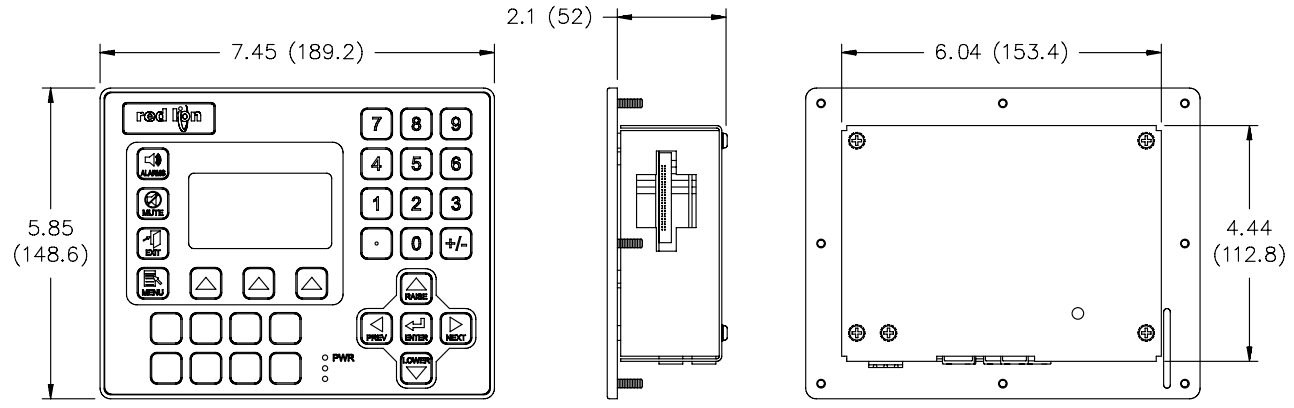
   Serial Ports: Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
   PGM Port: RS232 port via RJ12.
   COMMS Ports: RS422/485 port via RJ45, and RS232 port via RJ12. These two ports share the same hardware; the G303 multiplexes the ports to communicate via two protocols. These ports may be used to configure different master protocols, but only one port may be used if configuring a slave protocol or AB DH485.
   DH485 TXEN: Transmit enable; open collector, V_{OH} = 15 VDC, V_{OL} = 0.5 V @ 25 mA max.
   Note: For additional information on the communications or signal common and connections to earth ground please see "Connecting to Earth Ground" in the section "Installing and Powering the G303".
   Ethernet Port: 10 BASE-T / 100 BASE-TX
   RJ45 jack is wired as a NIC (Network Interface Card).
7. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: 0 to 50°C
   Storage Temperature Range: -30 to 70°C
   Operating and Storage Humidity: 80% maximum relative humidity (non-condensing) from 0 to 50°C.
   Vibration according to IEC 68-2-6: Operational 5 to 8 Hz, 0.8" (p-p), 8 to 500 Hz, in X, Y, Z direction, duration: 1 hour, 3 g.
   Shock according to IEC 68-2-27: Operational 40 g, 9 msec in 3 directions.
   Altitude: Up to 2000 meters.
8. **CERTIFICATIONS AND COMPLIANCES**:
   SAFETY
   UL Recognized Component, File #E179259, UL61010-1, CSA 22.2 No. 61010-1
   Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.
   UL Listed, File #E211967, UL61010-1, UL1604, CSA 22.2 No. 61010.1, CSA 22.2 No. 213-M1987
   LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
   Type 4X Enclosure rating (Face only), UL50
   IECEE CB Scheme Test Certificate #US/9737B/UL
   CB Scheme Test Report #E179259-V01-S04
   Issued by Underwriters Laboratories Inc.
   IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
   IP66 Enclosure rating (Face only), IEC 529
   ELECTROMAGNETIC COMPATIBILITY
   Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.

Immunity to Industrial Locations:

Electrostatic discharge	EN 61000-4-2	Criterion A 4 kV contact discharge 8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Criterion A 10 V/m
Fast transients (burst)	EN 61000-4-4	Criterion A 2 kV power 1 kV signal
Surge	EN 61000-4-5	Criterion B 1 kV L-L, 2 kV L&N-E power
RF conducted interference	EN 61000-4-6	Criterion A 3 V/rms
Emissions:		
Emissions	EN 55011	Class B

   Notes:
   1. Criterion A: Normal operation within specified limits.
   2. Criterion B: Temporary loss of performance from which the unit self-recovers.
9. **CONNECTIONS**: Compression cage-clamp terminal block.
   Wire Gage: 12-30 AWG copper wire
   Torque: 5-7 inch-pounds (56-79 N-cm)
10. **CONSTRUCTION**: Steel rear metal enclosure with NEMA 4X/IP66 aluminum front plate when correctly fitted with the gasket provided. Installation Category I, Pollution Degree 2.
11. **MOUNTING REQUIREMENTS**: Maximum panel thickness is 0.25" (6.3 mm). For NEMA 4X/IP66 sealing, a steel panel with a minimum thickness of 0.125" (3.17 mm) is recommended.
    Maximum Mounting Stud Torque: 17 inch-pounds (1.92 N-m)
12. **WEIGHT**: 1.96 lbs (0.89 Kg)

DIMENSIONS In inches (mm)



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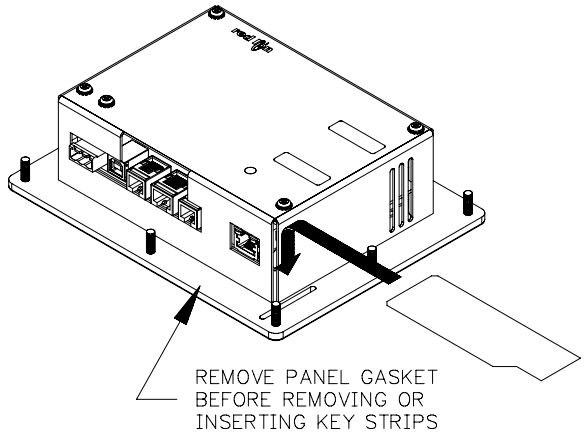
INSTALLING AND POWERING THE G303

USER IDENTIFIABLE KEYS

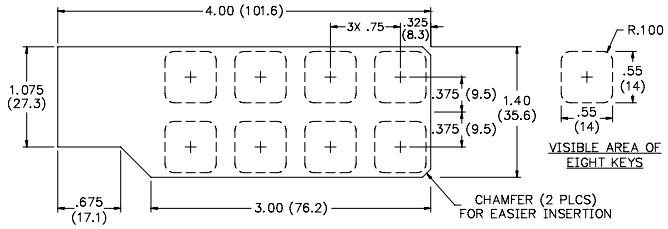
The G303 unit comes with a pre-printed key strip inserted. This key strip is labeled F1 through F8 and corresponds to Crimson software.

If desired, these keys may be custom labeled for specific functions. The default key strip may be removed and a custom key strip inserted. Each unit is delivered with two sheets of white "Cover 65" paper. This 8½ x11 paper may be used with most copiers, jet printers, or laser printers.



Custom key strips are made easily using the Adobe Acrobat file available from www.redlion.net or included with each Crimson CD. This program allows users to enter custom text and color schemes.

If more customization is needed, a graphics package can be used. The key strip dimensions are as follows.



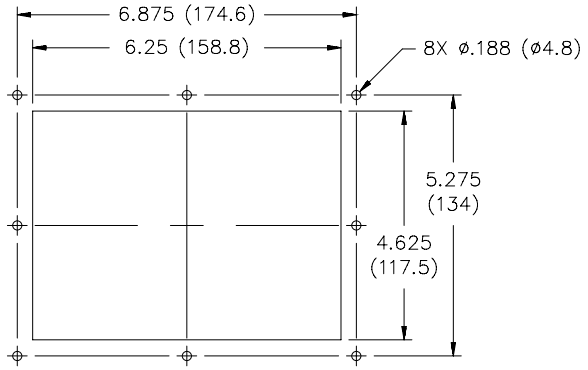
When inserting the key strip into the slot in the G303 panel, start one corner first then slowly insert the strip into place.

Note: Key strips need to be inserted into the unit before mounting into a panel.

MOUNTING INSTRUCTIONS

This operator interface is designed for through-panel mounting. A panel cut-out diagram and a template are provided. Care should be taken to remove any loose material from the mounting cut-out to prevent that material from falling into the operator interface during installation. A gasket is provided to enable sealing to NEMA 4X/IP66 specification. Install the eight kep nuts provided and tighten evenly for uniform gasket compression.

Note: tightening the kep nuts beyond a maximum of 17 inch-pounds (1.92 N-m) may cause damage to the front panel.



All tolerances ±0.010" (±0.25 mm).

ALL NONINCENDIVE CIRCUITS MUST BE WIRED USING DIVISION 2 WIRING METHODS AS SPECIFIED IN ARTICLE 501-4 (b), 502-4 (b), AND 503-3 (b) OF THE NATIONAL ELECTRICAL CODE, NFPA 70 FOR INSTALLATION WITHIN THE UNITED STATES, OR AS SPECIFIED IN SECTION 19-152 OF CANADIAN ELECTRICAL CODE FOR INSTALLATION IN CANADA.

CONNECTING TO EARTH GROUND

Each G303 has a chassis ground terminal on the back of the unit. Your unit should be connected to earth ground (protective earth).

The chassis ground is not connected to signal common of the unit. Maintaining isolation between earth ground and signal common is not required to operate your unit. But, other equipment connected to this unit may require isolation between signal common and earth ground. *To maintain isolation between signal common and earth ground care must be taken when connections are made to the unit.* For example, a power supply with isolation between its signal common and earth ground must be used. Also, plugging in a USB cable may connect signal common and earth ground.[1]

1. USB's shield may be connected to earth ground at the host. USB's shield in turn may also be connected to signal common.

POWER SUPPLY REQUIREMENTS

The G303 requires a 24 VDC power supply rated at 9.5 W. Your unit may draw considerably less than 9.5 W depending upon the options being used. As additional features are used your unit will draw increasing amounts of power. Items that could cause increases in current are additional communications, optional communications card, Compact Flash card, and other features programmed through Crimson.

In any case, it is very important that the power supply is mounted correctly if the unit is to operate reliably. Please take care to observe the following points:

- The power supply must be mounted close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the operator interface. Ideally, the shortest length possible should be used.
- The wire used to connect the operator interface's power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
- A power supply with a Class 2 or SELV rating is to be used. A Class 2 or SELV power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for "safety extra-low voltage." Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.

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COMMUNICATING WITH THE G303

CONFIGURING A G303

The G303 is configured using Crimson software. Crimson is available as a free download from Red Lion's website, or it can be ordered on CD. Updates to Crimson for new features and drivers are posted on the website as they become available. By configuring the G303 using the latest version of Crimson, you are assured that your unit has the most up to date feature set. Crimson software can configure the G303 through the RS232 PGM port, USB port, or CompactFlash.

The USB port is connected using a standard USB cable with a Type B connector. The driver needed to use the USB port will be installed with Crimson.

The RS232 PGM port uses a programming cable made by Red Lion to connect to the DB9 COM port of your computer. If you choose to make your own cable, use the "G303 Port Pin Out Diagram" for wiring information.

The CompactFlash can be used to program a G3 by placing a configuration file and firmware on the CompactFlash card. The card is then inserted into the target G3 and powered. Refer to the Crimson literature for more information on the proper names and locations of the files.

CABLES AND DRIVERS

Red Lion has a wide range of cables and drivers for use with many different communication types. A list of these drivers and cables along with pin outs is available from Red Lion's website. New cables and drivers are added on a regular basis. If making your own cable, refer to the "G303 Port Pin Outs" for wiring information.

USB, DATA TRANSFERS FROM THE COMPACTFLASH CARD

WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

In order to transfer data from the CompactFlash card via the USB port, a driver must be installed on your computer. This driver is installed with Crimson and is located in the folder C:\Program Files\Red Lion Controls\Crimson 2.0\Device\ after Crimson is installed. This may have already been accomplished if your G303 was configured using the USB port.

Once the driver is installed, connect the G303 to your PC with a USB cable, and follow "Mounting the CompactFlash" instructions in the Crimson 2 user manual.

Note that using the USB port for frequent data transfers is not recommended. For frequent data transfers it is recommended that the Ethernet connection be used. Through the Ethernet connection a web page can be set up to view logged data. Refer to the Crimson 2.0 manual for details.

ETHERNET COMMUNICATIONS

Ethernet communications can be established at either 10 BASE-T or 100 BASE-TX. The G303 unit's RJ45 jack is wired as a NIC (Network Interface Card). For example, when wiring to a hub or switch use a straight-through cable, but when connecting to another NIC use a crossover cable.

The Ethernet connector contains two LEDs. A yellow LED in the upper right, and a bi-color green/amber LED in the upper left. The LEDs represent the following statuses:

LED COLOR	DESCRIPTION
YELLOW solid	Link established.
YELLOW flashing	Data being transferred.
GREEN	10 BASE-T Communications
AMBER	100 BASE-TX Communications

The Crimson manual contains additional information on Ethernet communications.

RS232 PORTS

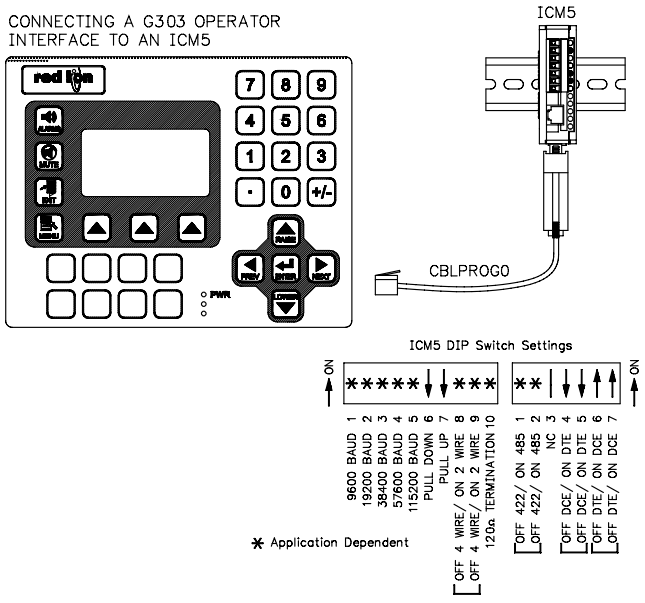
The G303 has two RS232 ports. There is the PGM port and the COMMS port. Although only one of these ports can be used for programming, both ports can be used for communications with a PLC.

The RS232 PGM port can be used for either master or slave protocols with any G303 configuration. The RS232 COMMS and RS422/485 COMMS ports are multiplexed because they share the same hardware. Both COMMS ports can be used with master protocols. However, when the RS232 COMMS port is used with a slave protocol, the RS422/485 COMMS port is not available.

Examples of RS232 communications could involve another Red Lion product or a PC. By using a cable with RJ12 ends on it, and a twist in the cable, RS232 communications with another G3 product or the Modular Controller can be established. Red Lion part numbers for cables with a twist in them are CBLPROG0 [1], CBLRLC01 [2], or CBLRC02 [3].

G3 RS232 to a PC

Connections			
G3: RJ12	Name	PC: DB9	Name
4	COMM	1	DCD
5	Tx	2	Rx
2	Rx	3	Tx
	N/C	4	DTR
3	COM	5	GND
	N/C	6	DSR
1	CTS	7	RTS
6	RTS	8	CTS
	N/C	9	RI



[1] CBLPROG0 can also be used to communicate with either a PC or an ICM5.
[2] DB9 adapter not included, 1 foot long.
[3] DB9 adapter not included, 10 feet long.

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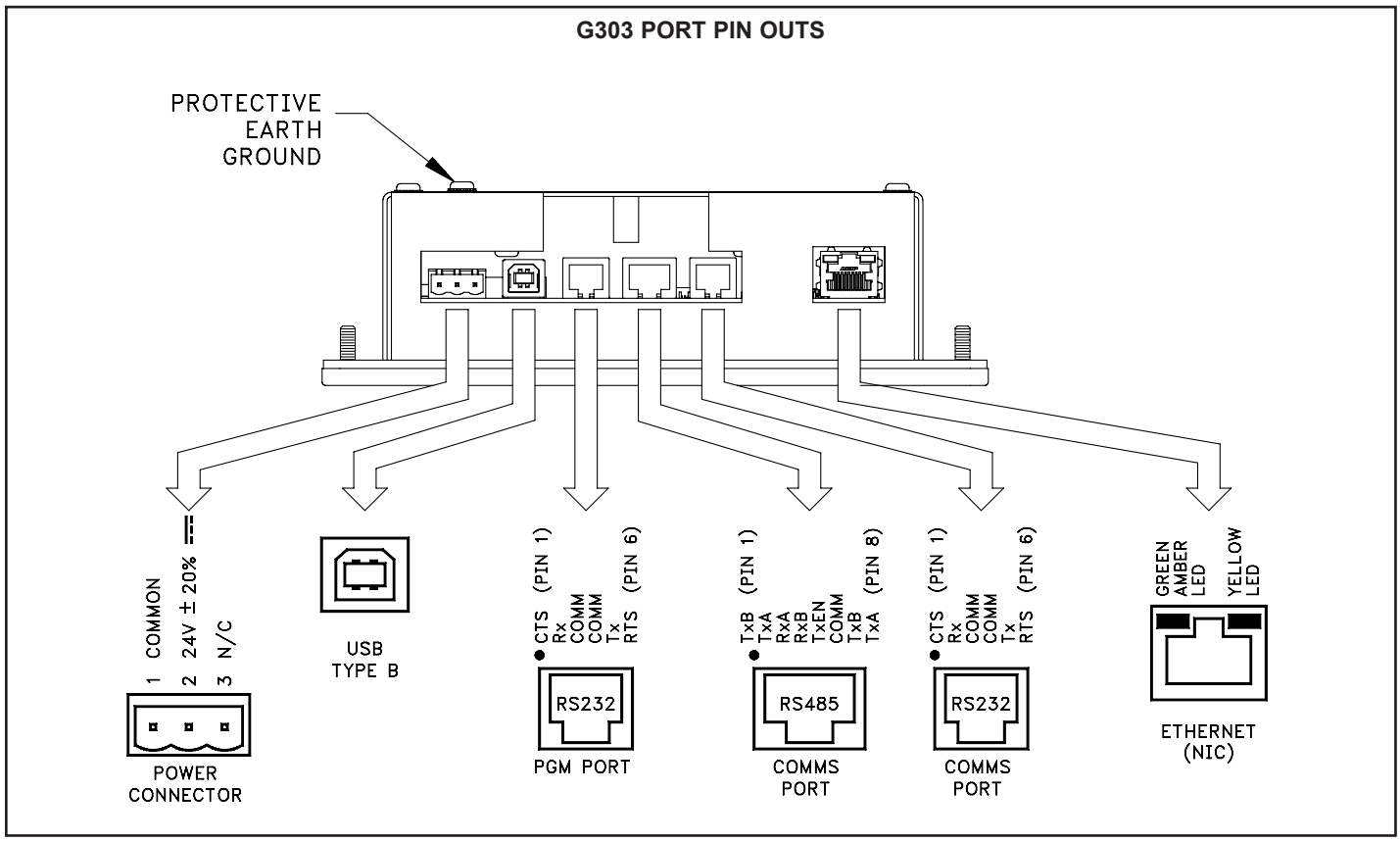
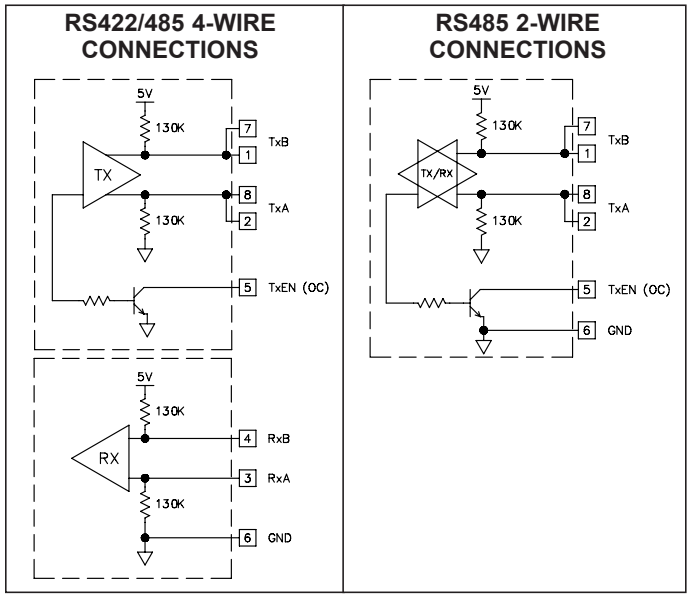


RS422/485 COMMS PORT

The G303 has one RS422/485 port. This port can be configured to act as either RS422 or RS485.

The RS422/485 COMMS and RS232 COMMS ports are multiplexed because they share the same hardware. Both COMMS ports can be used with master protocols. However, when the RS422/485 COMMS port is used with a slave protocol, the RS232 COMMS port is not available.



***Note**: All Red Lion devices connect A to A and B to B, except for Paradigm devices. Refer to www.redlion.net for additional information.*

Examples of RS485 2-Wire Connections

G3 to Red Lion RJ11 (CBLRLC00) DLC, IAMS, ITMS, PAXCDC4C

Connections			
G3: RJ45	Name	RLC: RJ11	Name
5	TxEN	2	TxEN
6	COM	3	COM
1	TxB	5	B-
2	TxA	4	A+

G3 to Modular Controller (CBLRLC05)

Connections			
G3	Name	Modular Controller	Name
1,4	TxB	1,4	TxB
4,1	RxB	4,1	RxB
2,3	TxA	2,3	TxA
3,2	RxA	3,2	RxA
5	TxEN	5	TxEN
6	COM	6	COM
7	TxB	7	TxB
8	TxA	8	TxA

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DH485 COMMUNICATIONS

The G303's RS422/485 COMMS port can also be used for Allen Bradley DH485 communications. When this port is configured to communicate DH485, the RS232 COMMS port can not be used because the ports share the same hardware and the G303 multiplexes the ports to communicate via two protocols.

WARNING: **DO NOT** use a standard DH485 cable to connect this port to Allen Bradley equipment. A cable and wiring diagram are available from Red Lion.

G3 to AB SLC 500 (CBLAB003)

Connections			
RJ45: RLC	Name	RJ45: A-B	Name
1	TxB	1	A
2	TxA	2	B
3, 8	RxA	-	24V
4, 7	RxB	-	COMM
5	TxEN	5	TxEN
6	COMM	4	SHIELD
4, 7	TxB	-	COMM
3, 8	TxA	-	24V

SOFTWARE/UNIT OPERATION

FRONT PANEL LEDS

There are three front panel LEDs. Shown below is the default status of the LEDs.

LED	INDICATION
RED (TOP, LABELED "PWR")	
FLASHING	Unit is in the boot loader, no valid configuration is loaded.[1]
STEADY	Unit is powered and running an application.
YELLOW (MIDDLE)	
OFF	No CompactFlash card is present.
STEADY	Valid CompactFlash card present.
FLASHING RAPIDLY	CompactFlash card being checked.
FLICKERING	Unit is writing to the CompactFlash, either because it is storing data, or because the PC connected via the USB port has locked the drive.[2]
FLASHING SLOWLY	Incorrectly formatted CompactFlash card present.
GREEN (BOTTOM)	
FLASHING	A tag is in an alarm state.
STEADY	Valid configuration is loaded and there are no alarms present.

1. The operator interface is shipped without a configuration. After downloading a configuration, if the light remains in the flashing state continuously, try cycling power. If the LED still continues to flash, try downloading a configuration again.
2. Do not turn off power to the unit while this light is flickering. The unit writes data in two minute intervals. Later Microsoft operating systems will not lock the drive unless they need to write data; Windows 98 may lock the drive any time it is mounted, thereby interfering with logging. Refer to "Mounting the CompactFlash" in the Crimson 2 User Manual.

CRIMSON SOFTWARE

Crimson software is available as a free download from Red Lion's website or it can be purchased on a CD, see "Ordering Information" for part number. The latest version of the software is always available from the website, and updating your copy is free.

KEYPAD

The G303 keypad consists of five unique key types. There are eight legendable keys (refer to "User Legendable Keys" for more information). A five key navigational keypad area. A twelve key numeric keypad with ± and decimal point. Three soft keys for on-screen menu selections. And, four keys labeled ALARMS, MUTE, EXIT, and MENU.

TROUBLESHOOTING YOUR G303

If for any reason you have trouble operating, connecting, or simply have questions concerning your new G303, contact Red Lion's technical support. For contact information, refer to the back page of this bulletin for phone and fax numbers.

EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net

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BATTERY & TIME KEEPING

WARNING - EXPLOSION HAZARD - THE AREA MUST BE KNOWN TO BE NON-HAZARDOUS BEFORE SERVICING/ REPLACING THE UNIT AND BEFORE INSTALLING OR REMOVING I/O WIRING AND BATTERY.

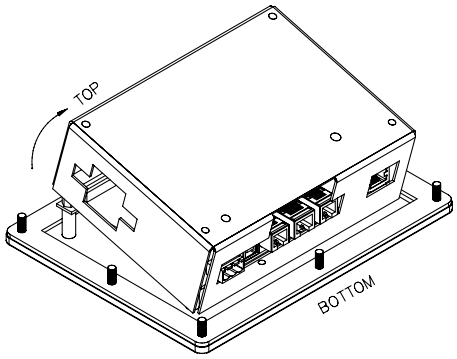
WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN DISCONNECTED AND THE AREA IS KNOWN TO BE NON-HAZARDOUS.

A battery is used to keep time when the unit is without power. Typical accuracy of the G303 time keeping is less than one minute per month drift. The battery of a G303 unit has no affect on the unit's memory as all configurations and data are stored in non-volatile memory.

CAUTION: The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

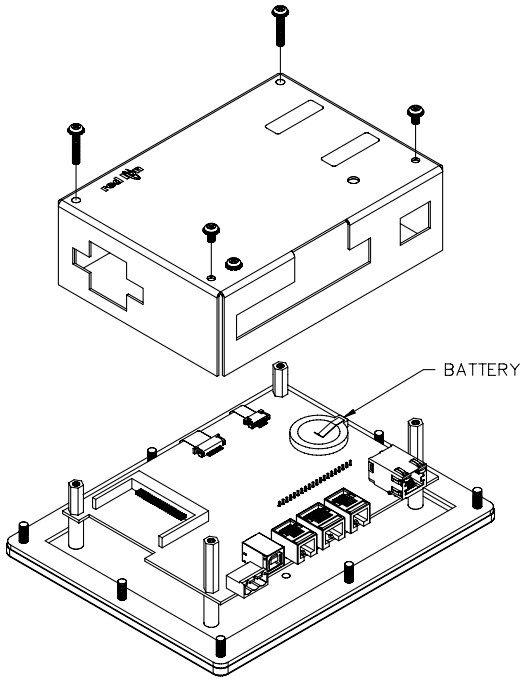
To change the battery of a G303, remove power, cabling, and then the rear cover of the unit. To remove the cover, remove the four screws designated by the arrows on the rear of the unit. Then, by lifting the top side, hinge the cover, thus providing clearance for the connectors on the bottom side of the PCB as shown in the illustration below. Install in the reverse manner.

Remove the old battery* from the holder and replace with the new battery. Replace the rear cover, cables, and re-apply power. Using Crimson or the unit's keypad, enter the correct time and date.



** Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. Also, the battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents come into contact with human skin.*

The battery used by the G303 is a lithium type CR2025.



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OPTIONAL FEATURES AND ACCESSORIES

INDOOR VERSUS OUTDOOR

Red Lion offers two versions of its G303 unit. The G303M000 uses an overlay with a textured finish and keys that are embossed. This overlay is not rated for outdoor use. The G303S000 uses an overlay with a glossy finish that uses a UV rated material for outdoor use. The keys on this overlay are not embossed.

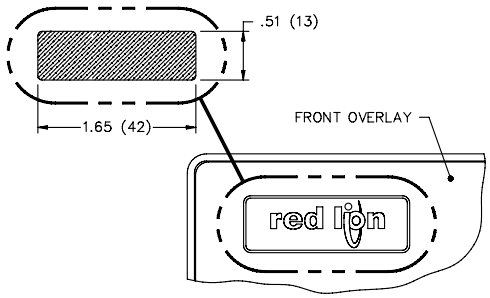
OPTIONAL COMMUNICATION CARD

Red Lion offers optional communication cards for fieldbus communications. These communication cards will allow your G303 to communicate with many of the popular fieldbus protocols.

Red Lion is also offering a communications card for additional RS232 and RS422/485 communications. Visit Red Lion's website for information and availability of these cards.

CUSTOM LOGO

Each G3 operator interface has an embossed area containing the Red Lion logo. Red Lion can provide custom logos to apply to this area. Contact your distributor for additional information and pricing.

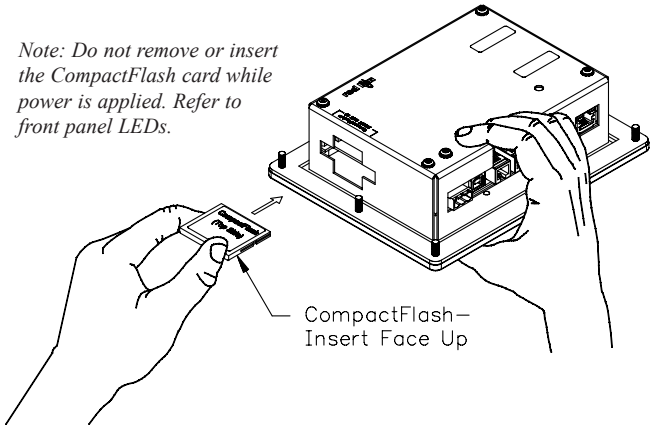


COMPACTFLASH SOCKET

CompactFlash socket is a Type II socket that can accept either Type I or II cards. Use cards with a minimum of 4 Mbytes and a maximum of 2 Gbytes with the G303's CompactFlash socket. Cards are available at most computer and office supply retailers.

CompactFlash can be used for configuration transfers, larger configurations, data logging, and trending.

Note: Do not remove or insert the CompactFlash card while power is applied. Refer to front panel LEDs.



Information stored on a CompactFlash card by a G303 can be read by a card reader attached to a PC. This information is stored in IBM (Windows®) PC compatible FAT16 file format.

NOTE

For reliable operation in all of our products, Red Lion recommends the use of SanDisk® and SimpleTech brands of CompactFlash cards.

Industrial grade versions that provide up to two million write/erase cycles minimum are available from Red Lion.

LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

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Red Lion Controls
20 Willow Springs Circle
York PA 17406
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839

Red Lion Controls BV
Printerweg 10
NL - 3821 AD Amersfoort
Tel +31 (0) 334 723 225
Fax +31 (0) 334 893 793

Red Lion Controls AP
Unit 101, XinAn Plaza
Building 13, No.99 Tianzhou Road
ShangHai, P.R. China 200223
Tel +86 21 6113-3688
Fax +86 21 6113-3683

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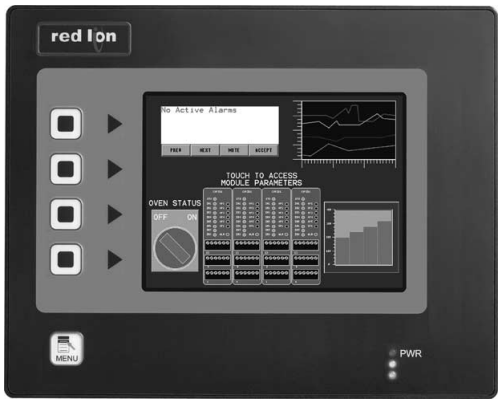
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839
www.redlion.net

Bulletin No. G306A-B
Drawing No. LP0666
Released 4/08

MODEL G306A - GRAPHIC COLOR LCD OPERATOR INTERFACE TERMINAL WITH TFT QVGA DISPLAY AND TOUCHSCREEN



- *CONFIGURED USING CRIMSON® SOFTWARE (BUILD 424 OR NEWER)*
- *UP TO 5 RS-232/422/485 COMMUNICATIONS PORTS (2 RS-232 AND 1 RS-422/485 ON BOARD, 1 RS-232 AND 1 RS422/485 ON OPTIONAL COMMUNICATIONS CARD)*
- *10 BASE T/100 BASE-TX ETHERNET PORT TO NETWORK UNITS AND HOST WEB PAGES*
- *USB PORT TO DOWNLOAD THE UNIT'S CONFIGURATION FROM A PC OR FOR DATA TRANSFERS TO A PC*
- *UNIT'S CONFIGURATION IS STORED IN NON-VOLATILE MEMORY (8 MBYTE FLASH)*
- *COMPACTFLASH® SOCKET TO INCREASE MEMORY CAPACITY*
- *5.7-INCH TFT ACTIVE MATRIX 256 COLOR QVGA 320 X 240 PIXEL LCD*
- *5-BUTTON KEYPAD FOR ON-SCREEN MENUS*
- *THREE FRONT PANEL LED INDICATORS*
- *POWER UNIT FROM 24 VDC ±20% SUPPLY*
- *RESISTIVE ANALOG TOUCHSCREEN*

c UL us LISTED 63YN
LABORATORY EQUIPMENT

FOR USE IN HAZARDOUS LOCATIONS:
Class I, Division 2, Groups A, B, C, and D
Class II, Division 2, Groups F and G
Class III, Division 2

GENERAL DESCRIPTION

The G306A Operator Interface Terminal combines unique capabilities normally expected from high-end units with a very affordable price. It is built around a high performance core with integrated functionality. This core allows the G306A to perform many of the normal features of the Paradigm range of Operator Interfaces while improving and adding new features.

The G306A is able to communicate with many different types of hardware using high-speed RS232/422/485 communications ports and Ethernet 10 Base T/100 Base-TX communications. In addition, the G306A features USB for fast downloads of configuration files and access to trending and data logging. A CompactFlash socket is provided so that Flash cards can be used to collect your trending and data logging information as well as to store larger configuration files.

In addition to accessing and controlling of external resources, the G306A allows a user to easily view and enter information. Users can enter data through the touchscreen and/or front panel 5-button keypad.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller.

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2/CLASS II, DIVISION 2/CLASS III, DIVISION 2

CAUTION: Risk Of Danger.
Read complete instructions prior to installation and operation of the unit.

CAUTION: Risk of electric shock.

CompactFlash is a registered trademark of CompactFlash Association.

CONTENTS OF PACKAGE

- G306A Operator Interface.
- Panel gasket.
- Template for panel cutout.
- Hardware packet for mounting unit into panel.
- Terminal block for connecting power.

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
G306A	Operator Interface for indoor applications, textured finish with embossed keys	G306A000
G3CF	64 MB CompactFlash Card [5]	G3CF064M
	256 MB CompactFlash Card [5]	G3CF256M
	512 MB CompactFlash Card [5]	G3CF512M
G3RS	RS232/485 Optional Communication Card	G3RS0000
G3CN	CANopen Optional Communication Card	G3CN0000
G3DN	DeviceNet option card for G3 operator interfaces lated high speed communications ports	G3DN0000
G3PBDP	Profibus DP Optional Communication Card	G3PBDP00
PSDR7	DIN Rail Power Supply	PSDR7000
SFCRM2	Crimson 2.0 [2]	SFCRM200
CBL	RS-232 Programming Cable	CBLPROG0
	USB Cable	CBLUSB00
	Communications Cables [1]	CBLxxxxx
DR	DIN Rail Mountable Adapter Products [3]	DRxxxxxx
	Replacement Battery [4]	BNL20000
G3FILM	Protective Films	G3FILM06

[1] Contact your Red Lion distributor or visit our website for complete selection.
[2] Use this part number to purchase the Crimson® software on CD with a printed manual, USB cable, and RS-232 cable. Otherwise, download for free from www.redlion.net.
[3] Red Lion offers RJ modular jack adapters. Refer to the DR literature for complete details.
[4] Battery type is lithium coin type CR2025.
[5] Industrial grade two million write cycles.

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SPECIFICATIONS

1. **POWER REQUIREMENTS**:
   Must use Class 2 or SELV rated power supply.
   Power connection via removable three position terminal block.
   Supply Voltage: +24 VDC ±20%
   Typical Power[1]: 8 W
   Maximum Power[2]: 14 W
   Notes:
   1. Typical power with +24 VDC, RS232/485 communications, Ethernet communications, CompactFlash card installed, and display at full brightness.
   2. Maximum power indicates the most power that can be drawn from the G306A. Refer to "Power Supply Requirements" under "Installing and Powering the G306A."
   3. The G306A's circuit common is not connected to the enclosure of the unit. See "Connecting to Earth Ground" in the section "Installing and Powering the G306A."
   4. Read "Power Supply Requirements" in the section "Installing and Powering the G306A" for additional power supply information.
2. **BATTERY**: Lithium coin cell. Typical lifetime of 10 years.
3. **LCD DISPLAY**:

SIZE	5.7-inch
TYPE	TFT
COLORS	256
PIXELS	320 X 240
BRIGHTNESS	500 cd/m^2
BACKLIGHT*	40,000 HR TYP.

*Lifetime at room temperature. Refer to "Display" in "Software/Unit Operation"

4. **5-KEY KEYPAD**: for on-screen menus.
5. **TOUCHSCREEN**: Resistive analog
6. **MEMORY**:
   On Board User Memory: 8 Mbyte of non-volatile Flash memory.
   Memory Card: CompactFlash Type II slot for Type I and Type II CompactFlash cards.
7. **COMMUNICATIONS**:
   USB Port: Adheres to USB specification 1.1. Device only using Type B connection.

> WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

   Serial Ports: Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
   PGM Port: RS232 port via RJ12.
   COMMS Ports: RS422/485 port via RJ45, and RS232 port via RJ12.
   DH485 TXEN: Transmit enable; open collector, V_{OH} = 15 VDC, V_{OL} = 0.5 V @ 25 mA max.
   Note: For additional information on the communications or signal common and connections to earth ground please see the "Connecting to Earth Ground" in the section "Installing and Powering the G306A."
   Ethernet Port: 10 BASE-T / 100 BASE-TX
   RJ45 jack is wired as a NIC (Network Interface Card).
   Isolation from Ethernet network to G3 operator interface: 1500 Vrms

8. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: 0 to 50°C
   Storage Temperature Range: -20 to 70°C
   Operating and Storage Humidity: 80% maximum relative humidity (non-condensing) from 0 to 50°C.
   Vibration according to IEC 68-2-6: Operational 5 to 8 Hz, 0.8" (p-p), 8 to 500 Hz, in X, Y, Z direction, duration: 1 hour, 3 g.
   Shock according to IEC 68-2-27: Operational 40 g, 9 msec in 3 directions.
   Altitude: Up to 2000 meters.
9. **CERTIFICATIONS AND COMPLIANCES**:
   SAFETY
   UL Recognized Component, File #E179259, UL61010-1, CSA 22.2 No.61010-1
   Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.
   UL Listed, File #E211967, UL61010-1, UL1604, CSA 22.2 No. 61010.1, CSA 22.2 No. 213-M1987
   LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
   Type 4X Indoor Enclosure rating (Face only), UL50
   IECEE CB Scheme Test Certificate #US/12460/UL,
   CB Scheme Test Report #E179259-A1-CB-1
   Issued by Underwriters Laboratories Inc.
   IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
   IP66 Enclosure rating (Face only), IEC 529
   ELECTROMAGNETIC COMPATIBILITY
   Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.

Immunity to Industrial Locations:

Electrostatic discharge	EN 61000-4-2	Criterion A 4 kV contact discharge 8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Criterion A 10 V/m
Fast transients (burst)	EN 61000-4-4	Criterion A 2 kV power 1 kV signal
Surge	EN 61000-4-5	Criterion A 1 kV L-L, 2 kV L&N-E power
RF conducted interference	EN 61000-4-6	Criterion A 3 V/rms

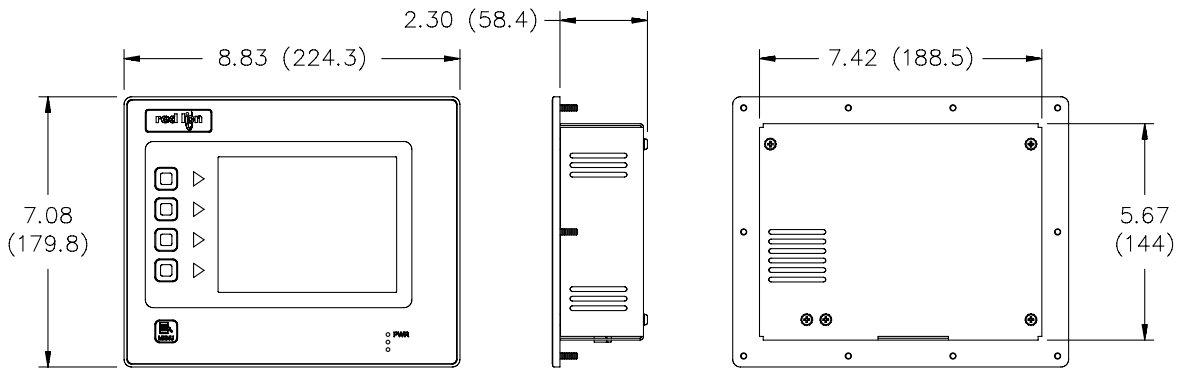
Emissions:

Emissions	EN 55011	Class A

Note:
1. Criterion A: Normal operation within specified limits.

10. **CONNECTIONS**: Compression cage-clamp terminal block.
    Wire Gage: 12-30 AWG copper wire
    Torque: 5-7 inch-pounds (56-79 N-cm)
11. **CONSTRUCTION**: Steel rear metal enclosure with NEMA 4X/IP66 aluminum front plate for indoor use only when correctly fitted with the gasket provided. Installation Category II, Pollution Degree 2.
12. **MOUNTING REQUIREMENTS**: Maximum panel thickness is 0.25" (6.3 mm). For NEMA 4X/IP66 sealing, a steel panel with a minimum thickness of 0.125" (3.17 mm) is recommended.
    Maximum Mounting Stud Torque: 17 inch-pounds (1.92 N-m)
13. **WEIGHT**: 3.0 lbs (1.36 Kg)

DIMENSIONS In inches (mm)



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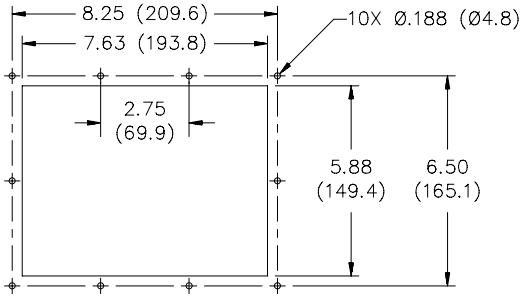
INSTALLING AND POWERING THE G306A

MOUNTING INSTRUCTIONS

This operator interface is designed for through-panel mounting. A panel cut-out diagram and a template are provided. Care should be taken to remove any loose material from the mounting cut-out to prevent that material from falling into the operator interface during installation. A gasket is provided to enable sealing to NEMA 4X/IP66 specification. Install the ten kep nuts provided and tighten evenly for uniform gasket compression.

Note: Tightening the kep nuts beyond a maximum of 17 inch-pounds (1.92 N-m) may cause damage to the front panel.



All tolerances ±0.010" (±0.25 mm).

ALL NONINCENDIVE CIRCUITS MUST BE WIRED USING DIVISION 2 WIRING METHODS AS SPECIFIED IN ARTICLE 501-4 (b), 502-4 (b), AND 503-3 (b) OF THE NATIONAL ELECTRICAL CODE, NFPA 70 FOR INSTALLATION WITHIN THE UNITED STATES, OR AS SPECIFIED IN SECTION 19-152 OF CANADIAN ELECTRICAL CODE FOR INSTALLATION IN CANADA.

CONNECTING TO EARTH GROUND

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

Each G306A has a chassis ground terminal on the back of the unit. Your unit should be connected to earth ground (protective earth).

The chassis ground is not connected to signal common of the unit. Maintaining isolation between earth ground and signal common is not required to operate your unit. But, other equipment connected to this unit may require isolation between signal common and earth ground. *To maintain isolation between signal common and earth ground care must be taken when connections are made to the unit.* For example, a power supply with isolation between its signal common and earth ground must be used. Also, plugging in a USB cable may connect signal common and earth ground.[1]

[1] USB's shield may be connected to earth ground at the host. USB's shield in turn may also be connected to signal common.

POWER SUPPLY REQUIREMENTS

The G306A requires a 24 VDC power supply. Your unit may draw considerably less than the maximum rated power depending upon the options being used. As additional features are used your unit will draw increasing amounts of power. Items that could cause increases in current are additional communications, optional communications card, CompactFlash card, and other features programmed through Crimson.

In any case, it is very important that the power supply is mounted correctly if the unit is to operate reliably. Please take care to observe the following points:

- The power supply must be mounted close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the operator interface. Ideally, the shortest length possible should be used.
- The wire used to connect the operator interface's power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
- A power supply with a Class 2 or SELV rating is to be used. A Class 2 or SELV power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for "safety extra-low voltage." Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.

COMMUNICATING WITH THE G306A

CONFIGURING A G306A

The G306A is configured using Crimson® software. Crimson is available as a free download from Red Lion's website, or it can be purchased on CD. Updates to Crimson for new features and drivers are posted on the website as they become available. By configuring the G306A using the latest version of Crimson, you are assured that your unit has the most up to date feature set. Crimson® software can configure the G306A through the RS232 PGM port, USB port, or CompactFlash.

The USB port is connected using a standard USB cable with a Type B connector. The driver needed to use the USB port will be installed with Crimson.

The RS232 PGM port uses a programming cable made by Red Lion to connect to the DB9 COM port of your computer. If you choose to make your own cable, use the "G306A Port Pin Out Diagram" for wiring information.

The CompactFlash can be used to program a G3 by placing a configuration file and firmware on the CompactFlash card. The card is then inserted into the target G3 and powered. Refer to the Crimson literature for more information on the proper names and locations of the files.

USB, DATA TRANSFERS FROM THE COMPACTFLASH CARD

WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

In order to transfer data from the CompactFlash card via the USB port, a driver must be installed on your computer. This driver is installed with Crimson and is located in the folder C:\Program Files\Red Lion Controls\Crimson 2.0\Device\ after Crimson is installed. This may have already been accomplished if your G306A was configured using the USB port.

Once the driver is installed, connect the G306A to your PC with a USB cable, and follow "Mounting the CompactFlash" instructions in the Crimson 2 user manual.

CABLES AND DRIVERS

Red Lion has a wide range of cables and drivers for use with many different communication types. A list of these drivers and cables along with pin outs is available from Red Lion's website. New cables and drivers are added on a regular basis. If making your own cable, refer to the "G306A Port Pin Outs" for wiring information.

ETHERNET COMMUNICATIONS

Ethernet communications can be established at either 10 BASE-T or 100 BASE-TX. The G306A unit's RJ45 jack is wired as a NIC (Network Interface Card). For example, when wiring to a hub or switch use a straight-through cable, but when connecting to another NIC use a crossover cable.

The Ethernet connector contains two LEDs. A yellow LED in the upper right, and a bi-color green/amber LED in the upper left. The LEDs represent the following statuses:

LED COLOR	DESCRIPTION
YELLOW solid	Link established.
YELLOW flashing	Data being transferred.
GREEN	10 BASE-T Communications
AMBER	100 BASE-TX Communications

On the rear of each unit is a unique 12-digit MAC address and a block for marking the unit with an IP address. Refer to the Crimson manual and Red Lion's website for additional information on Ethernet communications.

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RS232 PORTS

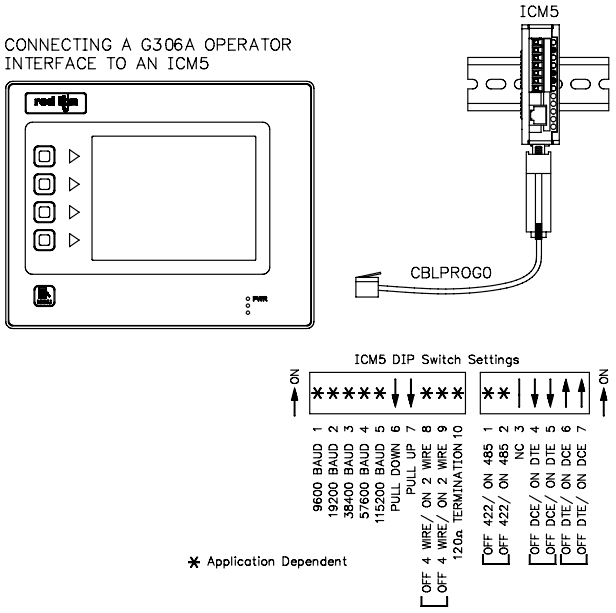
The G306A has two RS232 ports. There is the PGM port and the COMMS port. Although only one of these ports can be used for programming, both ports can be used for communications with a PLC.

The RS232 ports can be used for either master or slave protocols with any G306A configuration.

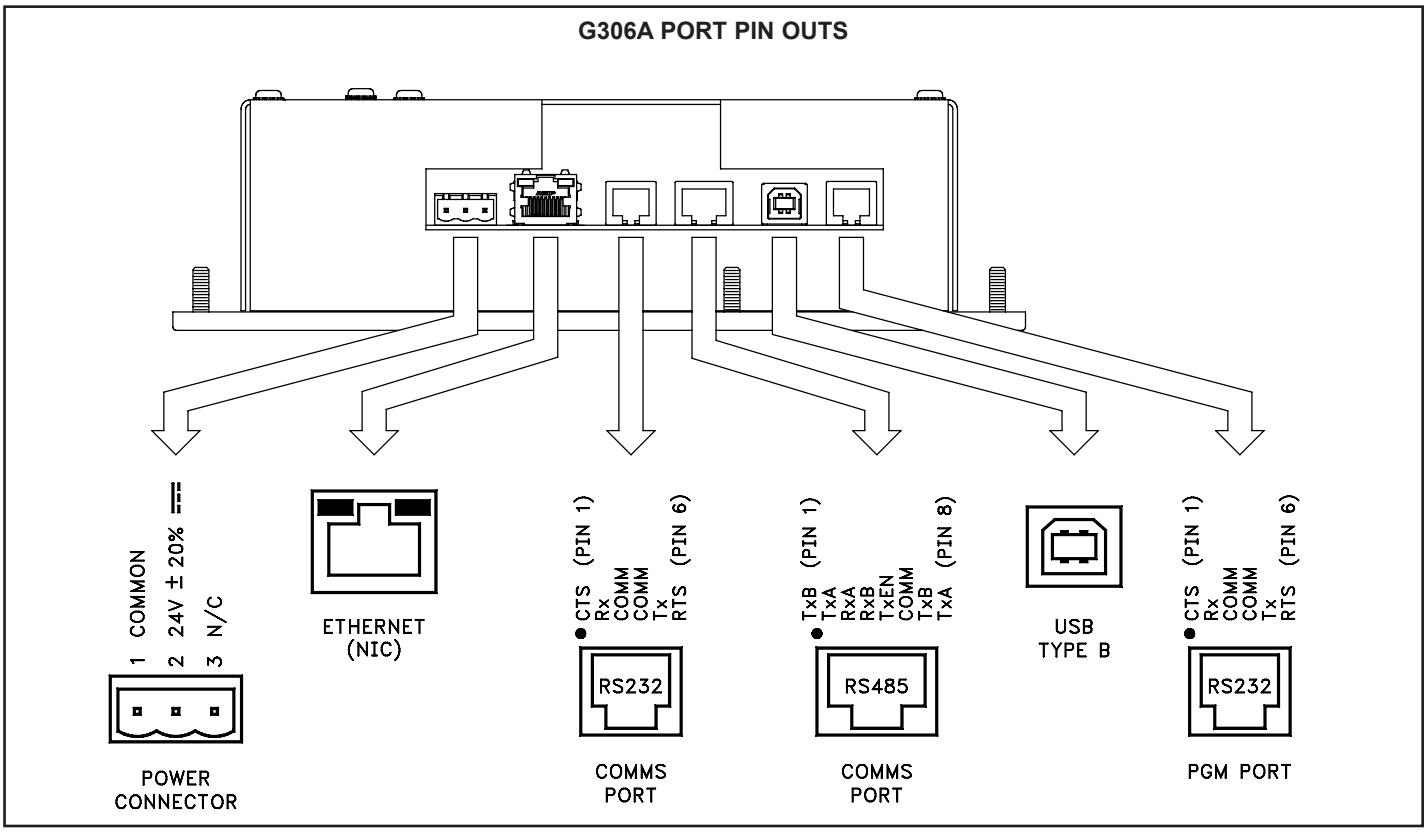
Examples of RS232 communications could involve another Red Lion product or a PC. By using a cable with RJ12 ends on it, and a twist in the cable, RS232 communications with another G3 product or the Modular Controller can be established. Red Lion part numbers for cables with a twist in them are CBLPROG0 [1], CBLRLC01 [2], or CBLRC02 [3].

G3 RS232 to a PC

Connections			
G3: RJ12	Name	PC: DB9	Name
4	COMM	1	DCD
5	Tx	2	Rx
2	Rx	3	Tx
	N/C	4	DTR
3	COM	5	GND
	N/C	6	DSR
1	CTS	7	RTS
6	RTS	8	CTS
	N/C	9	RI



[1] CBLPROG0 can also be used to communicate with either a PC or an ICM5.
[2] DB9 adapter not included, 1 foot long.
[3] DB9 adapter not included, 10 feet long.



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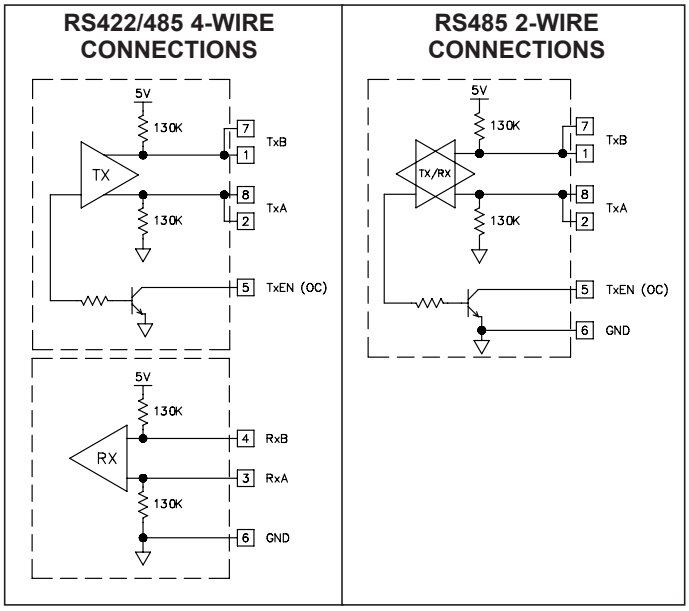
RS422/485 COMMS PORT

The G306A has one RS422/485 port. This port can be configured to act as either RS422 or RS485.



***Note**: All Red Lion devices connect A to A and B to B, except for Paradigm devices. Refer to www.redlion.net for additional information.*

DH485 COMMUNICATIONS

The G306A's RS422/485 COMMS port can also be used for Allen Bradley DH485 communications.

WARNING: **DO NOT** use a standard DH485 cable to connect this port to Allen Bradley equipment. A cable and wiring diagram are available from Red Lion.

G3 to AB SLC 500 (CBLAB003)

Connections			
RJ45: RLC	Name	RJ45: A-B	Name
1	TxB	1	A
2	TxA	2	B
3, 8	RxA	-	24V
4, 7	RxB	-	COMM
5	TxEN	5	TxEN
6	COMM	4	SHIELD
4, 7	TxB	-	COMM
3, 8	TxA	-	24V

Examples of RS485 2-Wire Connections

G3 to Red Lion RJ11 (CBLRLC00) DLC, IAMS, ITMS, PAXCDC4C

Connections			
G3: RJ45	Name	RLC: RJ11	Name
5	TxEN	2	TxEN
6	COM	3	COM
1	TxB	5	B-
2	TxA	4	A+

G3 to Modular Controller (CBLRLC05)

Connections			
G3	Name	Modular Controller	Name
1,4	TxB	1,4	TxB
4,1	RxB	4,1	RxB
2,3	TxA	2,3	TxA
3,2	RxA	3,2	RxA
5	TxEN	5	TxEN
6	COM	6	COM
7	TxB	7	TxB
8	TxA	8	TxA

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SOFTWARE/UNIT OPERATION

CRIMSON® SOFTWARE

Crimson® software is available as a free download from Red Lion's website or it can be purchased on a CD, see "Ordering Information" for part number. The latest version of the software is always available from the website, and updating your copy is free.

DISPLAY

This operator interface uses a liquid crystal display (LCD) for displaying text and graphics. The display utilizes a cold cathode fluorescent tube (CCFL) for lighting the display. The CCFL tubes can be dimmed for low light conditions.

These CCFL tubes have a limited lifetime. Backlight lifetime is based upon the amount of time the display is turned on at full intensity. Turning the backlight off when the display is not in use can extend the lifetime of your backlight. This can be accomplished through the Crimson® software when configuring your unit.

FRONT PANEL LEDS

There are three front panel LEDs. Shown below is the default status of the LEDs.

LED	INDICATION
RED (TOP, LABELED "PWR")	
FLASHING	Unit is in the boot loader, no valid configuration is loaded.[1]
STEADY	Unit is powered and running an application.
YELLOW (MIDDLE)	
OFF	No CompactFlash card is present.
STEADY	Valid CompactFlash card present.
FLASHING RAPIDLY	CompactFlash card being checked.
FLICKERING	Unit is writing to the CompactFlash, either because it is storing data, or because the PC connected via the USB port has locked the drive.[2]
FLASHING SLOWLY	Incorrectly formatted CompactFlash card present.
GREEN (BOTTOM)	
FLASHING	A tag is in an alarm state.
STEADY	Valid configuration is loaded and there are no alarms present.

[1] The operator interface is shipped without a configuration. After downloading a configuration, if the light remains in the flashing state continuously, try cycling power. If the LED still continues to flash, try downloading a configuration again.

[2] Do not turn off power to the unit while this light is flickering. The unit writes data in two minute intervals. Later Microsoft operating systems will not lock the drive unless they need to write data; Windows 98 may lock the drive any time it is mounted, thereby interfering with logging. Refer to "Mounting the CompactFlash" in the Crimson 2 User Manual.

TOUCHSCREEN

This operator interface utilizes a resistive analog touchscreen for user input. The unit will only produce an audible tone (beep) when a touch on an active touchscreen cell is sensed. The touchscreen is fully functional as soon as the operator interface is initialized, and can be operated with gloved hands.

KEYPAD

The G306A keypad consists of five keys that can be used for on-screen menus.

TROUBLESHOOTING YOUR G306A

If for any reason you have trouble operating, connecting, or simply have questions concerning your new G306A, contact Red Lion's technical support. For contact information, refer to the back page of this bulletin for phone and fax numbers.

EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net

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BATTERY & TIME KEEPING

WARNING - EXPLOSION HAZARD - THE AREA MUST BE KNOWN TO BE NON-HAZARDOUS BEFORE SERVICING/ REPLACING THE UNIT AND BEFORE INSTALLING OR REMOVING I/O WIRING AND BATTERY.

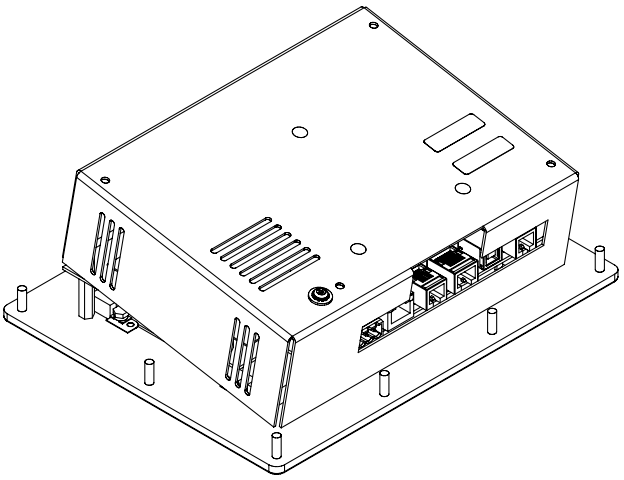
WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN DISCONNECTED AND THE AREA IS KNOWN TO BE NON-HAZARDOUS.

A battery is used to keep time when the unit is without power. Typical accuracy of the G306A time keeping is less than one minute per month drift. The battery of a G306A unit does not affect the unit's memory, all configurations and data is stored in non-volatile memory.

CAUTION: RISK OF ELECTRIC SHOCK
The inverter board, attached to the mounting plate, supplies the high voltage to operate the backlight. Touching the inverter board may result in injury to personnel.

CAUTION: The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

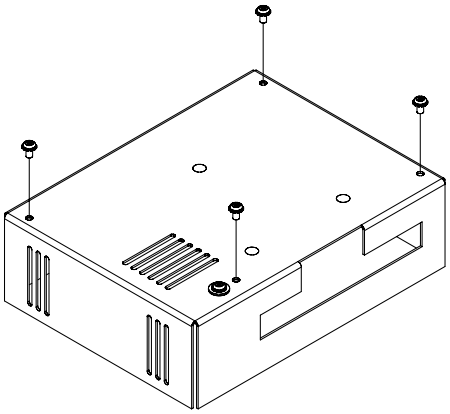
To change the battery of a G306A, remove power, cabling, and then the rear cover of the unit. To remove the cover, remove the four screws designated by the arrows on the rear of the unit. Then, by lifting the top side, hinge the cover, thus providing clearance for the connectors on the bottom side of the PCB as shown in the illustration below. Install in the reverse manner.

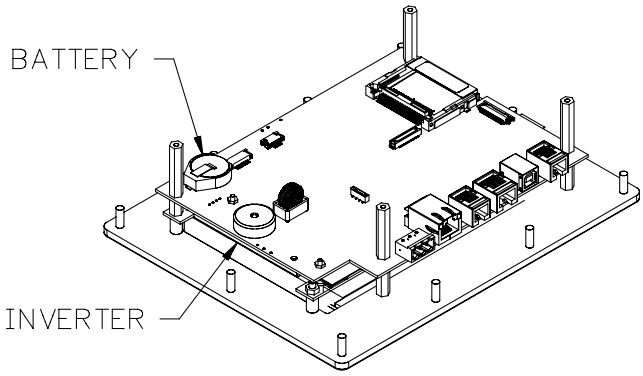


Remove the old battery* from the holder and replace with the new battery. Replace the rear cover, cables, and re-apply power. Using Crimson or the unit's keypad, enter the correct time and date.

** Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. Also, the battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents come into contact with human skin.*

The battery used by the G306A is a lithium type CR2025.





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OPTIONAL FEATURES AND ACCESSORIES

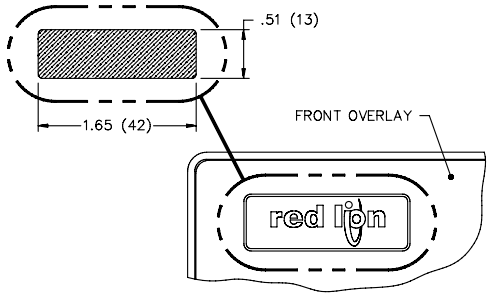
OPTIONAL COMMUNICATION CARD

Red Lion offers optional communication cards for fieldbus communications. These communication cards will allow your G306A to communicate with many of the popular fieldbus protocols.

Red Lion is also offering a communications card for additional RS232 and RS422/485 communications. Visit Red Lion's website for information and availability of these cards.

CUSTOM LOGO

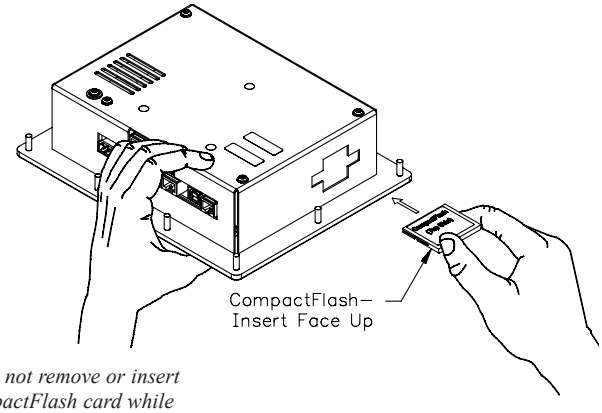
Each G3 operator interface has an embossed area containing the Red Lion logo. Red Lion can provide custom logos to apply to this area. Contact your distributor for additional information and pricing.



COMPACTFLASH SOCKET

CompactFlash socket is a Type II socket that can accept either Type I or II cards. Use cards with a minimum of 4 Mbytes and a maximum of 2 Gbytes with the G306A's CompactFlash socket. Cards are available at most computer and office supply retailers.

CompactFlash can be used for configuration transfers, larger configurations, data logging, and trending.



Note: Do not remove or insert the CompactFlash card while power is applied. Refer to "Front Panel LEDs."

Information stored on a CompactFlash card by a G306A can be read by a card reader attached to a PC. This information is stored in IBM (Windows®) PC compatible FAT16 file format.

NOTE

For reliable operation in all of our products, Red Lion recommends the use of SanDisk® and SimpleTech brands of CompactFlash cards.

Industrial grade versions that provide up to two million write/erase cycles minimum are available from Red Lion.

LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

No warranties expressed or implied are created with respect to The Company's products except those expressly contained herein. The Customer acknowledges the disclaimers and limitations contained herein and relies on no other warranties or affirmations.

Red Lion Controls
20 Willow Springs Circle
York PA 17406
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839

Red Lion Controls BV
Printerweg 10
NL - 3821 AD Amersfoort
Tel +31 (0) 334 723 225
Fax +31 (0) 334 893 793

Red Lion Controls AP
Unit 101, XinAn Plaza
Building 13, No.99 Tianzhou Road
ShangHai, P.R. China 200223
Tel +86 21 6113-3688
Fax +86 21 6113-3683

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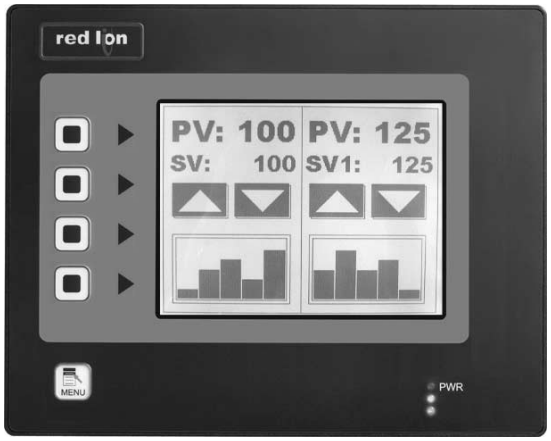
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839
www.redlion.net

Bulletin No. G306M-A
Drawing No. LP0728
Released 11/08

MODEL G306M - GRAPHIC MONOCHROME LCD OPERATOR INTERFACE TERMINAL WITH QVGA DISPLAY AND TOUCHSCREEN



- *CONFIGURED USING CRIMSON® SOFTWARE (VERSION 2.0 OR LATER)*
- *UP TO 5 RS-232/422/485 COMMUNICATIONS PORTS (2 RS-232 AND 1 RS-422/485 ON BOARD, 1 RS-232 AND 1 RS422/485 ON OPTIONAL COMMUNICATIONS CARD)*
- *10 BASE T/100 BASE-TX ETHERNET PORT TO NETWORK UNITS AND HOST WEB PAGES*
- *USB PORT TO DOWNLOAD THE UNIT'S CONFIGURATION FROM A PC OR FOR DATA TRANSFERS TO A PC*
- *UNIT'S CONFIGURATION IS STORED IN NON-VOLATILE MEMORY (4 MBYTE FLASH)*
- *COMPACTFLASH® SOCKET TO INCREASE MEMORY CAPACITY*
- *5.7-INCH FSTN MONOCHROME QVGA 320 X 240 PIXEL LCD WITH WHITE LED BACKLIGHT*
- *OUTDOOR UNIT WITH UV RATED DISPLAY AVAILABLE*
- *5-BUTTON KEYPAD FOR ON-SCREEN MENUS*
- *THREE FRONT PANEL LED INDICATORS*
- *POWER UNIT FROM 24 VDC ±20% SUPPLY*
- *RESISTIVE ANALOG TOUCHSCREEN*

GENERAL DESCRIPTION

The G306M Operator Interface Terminal combines unique capabilities normally expected from high-end units with a very affordable price. It is built around a high performance core with integrated functionality.

The G306 is able to communicate with many different types of hardware using high-speed RS232/422/485 communications ports and Ethernet 10 Base T/100 Base-TX communications. In addition, the G306 features USB for fast downloads of configuration files and access to trending and data logging. A CompactFlash socket is provided so that Flash cards can be used to collect your trending and data logging information as well as to store larger configuration files.

In addition to accessing and controlling of external resources, the G306 allows a user to easily view and enter information. The unit uses a Liquid Crystal Display (LCD) module, which is easily readable in both indoor and outdoor applications. Users can enter data through the touchscreen and/or front panel 5-button keypad.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller.

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

CAUTION: Risk Of Danger.
Read complete instructions prior to installation and operation of the unit.

CAUTION: Risk of electric shock.

CompactFlash is a registered trademark of CompactFlash Association.

CONTENTS OF PACKAGE

- G306M Operator Interface.
- Panel gasket.
- Template for panel cutout.
- Hardware packet for mounting unit into panel.
- Terminal block for connecting power.

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
G306M	Operator Interface for indoor applications, textured finish with embossed keys	G306M000
	Operator Interface for indoor or outdoor applications, glossy finish with UV rated overlay (keys are not embossed)	G306MS00
G3CF	64 MB CompactFlash Card [5]	G3CF064M
	256 MB CompactFlash Card [5]	G3CF256M
	512 MB CompactFlash Card [5]	G3CF512M
G3RS	RS232/485 Optional Communication Card	G3RS0000
G3CN	CANopen Optional Communication Card	G3CN0000
G3DN	DeviceNet option card for G3 operator interfaces with isolated high speed communications ports	G3DN0000
G3PBDP	Profibus DP Optional Communication Card	G3PBDP00
PSDR7	DIN Rail Power Supply	PSDR7000
SFCRM2	Crimson 2.0 [2]	SFCRM200
CBL	RS-232 Programming Cable	CBLPROG0
	USB Cable	CBLUSB00
	Communications Cables [1]	CBLxxxxx
DR	DIN Rail Mountable Adapter Products [3]	DRxxxxxx
	Replacement Battery [4]	BNL20000
G3FILM	Protective Films	G3FILM06

[1] Contact your Red Lion distributor or visit our website for complete selection.

[2] Use this part number to purchase Crimson software on CD with a printed manual, USB cable, and RS-232 cable. Otherwise, download for free from www.redlion.net.

[3] Red Lion offers RJ modular jack adapters. Refer to the DR literature for complete details.

[4] Battery type is lithium coin type CR2025.

[5] Industrial grade two million write cycles.

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SPECIFICATIONS

1. **POWER REQUIREMENTS**:
   Must use Class 2 or SELV rated power supply.
   Power connection via removable three position terminal block.
   Supply Voltage: +24 VDC ±20%
   Typical Power[1]: 8 W
   Maximum Power[2]: 14 W
   Notes:
   1. Typical power with +24 VDC, RS232/485 communications, Ethernet communications, CompactFlash card installed, and display at full brightness.
   2. Maximum power indicates the most power that can be drawn from the G306. Refer to "Power Supply Requirements" under "Installing and Powering the G306."
   3. The G306's circuit common is not connected to the enclosure of the unit. See "Connecting to Earth Ground" in the section "Installing and Powering the G306."
   4. Read "Power Supply Requirements" in the section "Installing and Powering the G306" for additional power supply information.
2. **BATTERY**: Lithium coin cell. Typical lifetime of 10 years.
3. **LCD DISPLAY**:

SIZE	5.7-inch
TYPE	FSTN
COLORS	2
PIXELS	320 X 240
BRIGHTNESS	165 cd/m^2
BACKLIGHT*	20,000 HR TYP.

*Lifetime at room temperature. Refer to "Display" in "Software/Unit Operation"

4. **5-KEY KEYPAD**: for on-screen menus.
5. **TOUCHSCREEN**: Resistive analog
6. **MEMORY**:
   On Board User Memory: 4 Mbyte of non-volatile Flash memory.
   Memory Card: CompactFlash Type II slot for Type I and Type II CompactFlash cards.
7. **COMMUNICATIONS**:
   USB Port: Adheres to USB specification 1.1. Device only using Type B connection.

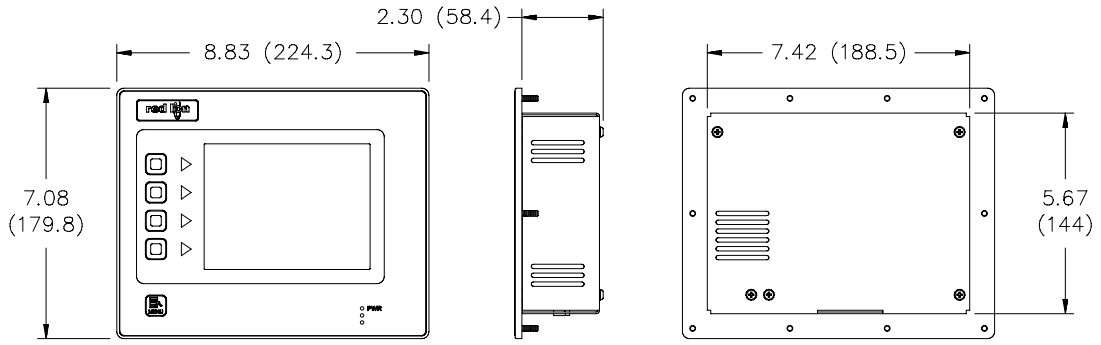
> WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

   Serial Ports: Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
   PGM Port: RS232 port via RJ12.
   COMMS Ports: RS422/485 port via RJ45, and RS232 port via RJ12.
   DH485 TXEN: Transmit enable; open collector, V_{OH} = 15 VDC, V_{OL} = 0.5 V @ 25 mA max.
   Note: For additional information on the communications or signal common and connections to earth ground please see the "Connecting to Earth Ground" in the section "Installing and Powering the G306."
   Ethernet Port: 10 BASE-T / 100 BASE-TX
   RJ45 jack is wired as a NIC (Network Interface Card).
   Isolation from Ethernet network to G3 operator interface: 1500 Vrms
8. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: 0 to 50°C
   Storage Temperature Range: -20 to 70°C
   Operating and Storage Humidity: 80% maximum relative humidity (non-condensing) from 0 to 50°C.
   Altitude: Up to 2000 meters.
9. **CERTIFICATIONS AND COMPLIANCES**:
   SAFETY
   IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
   IP66 Enclosure rating (Face only), IEC 529
   Type 4X Enclosure rating (Face only), UL50
   ELECTROMAGNETIC COMPATIBILITY
   Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.

Immunity to Industrial Locations:		
Electrostatic discharge	EN 61000-4-2	Criterion A 4 kV contact discharge 8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Criterion B 10 V/m
Fast transients (burst)	EN 61000-4-4	Criterion A 2 kV power 1 kV signal
Surge	EN 61000-4-5	Criterion B 1 kV L-L, 2 kV L&N-E power
RF conducted interference	EN 61000-4-6	Criterion A 3 V/rms
Emissions:		
Emissions	EN 55011	Class A

   Note:
   1. Criterion A: Normal operation within specified limits.
   2. Criterion B: Temporary loss of performance from which the unit self recovers.
10. **CONNECTIONS**: Compression cage-clamp terminal block.
    Wire Gage: 12-30 AWG copper wire
    Torque: 5-7 inch-pounds (56-79 N-cm)
11. **CONSTRUCTION**: Steel rear metal enclosure with NEMA 4X/IP66 aluminum front plate for indoor use only when correctly fitted with the gasket provided. Installation Category I, Pollution Degree 2.
12. **MOUNTING REQUIREMENTS**: Maximum panel thickness is 0.25" (6.3 mm). For NEMA 4X/IP66 sealing, a steel panel with a minimum thickness of 0.125" (3.17 mm) is recommended.
    Maximum Mounting Stud Torque: 17 inch-pounds (1.92 N-m)
13. **WEIGHT**: 3.0 lbs (1.36 Kg)

DIMENSIONS In inches (mm)



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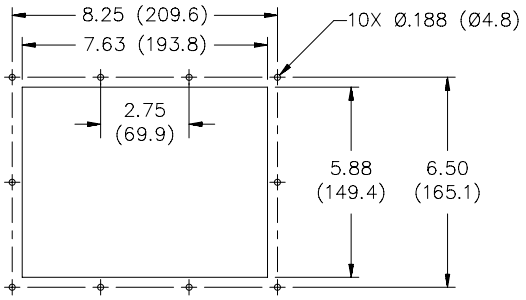
INSTALLING AND POWERING THE G306

MOUNTING INSTRUCTIONS

This operator interface is designed for through-panel mounting. A panel cut-out diagram and a template are provided. Care should be taken to remove any loose material from the mounting cut-out to prevent that material from falling into the operator interface during installation. A gasket is provided to enable sealing to NEMA 4X/IP66 specification. Install the ten kep nuts provided and tighten evenly for uniform gasket compression.

Note: Tightening the kep nuts beyond a maximum of 17 inch-pounds (1.92 N-m) may cause damage to the front panel.



All tolerances ±0.010" (±0.25 mm).

ALL NONINCENDIVE CIRCUITS MUST BE WIRED USING DIVISION 2 WIRING METHODS AS SPECIFIED IN ARTICLE 501-4 (b), 502-4 (b), AND 503-3 (b) OF THE NATIONAL ELECTRICAL CODE, NFPA 70 FOR INSTALLATION WITHIN THE UNITED STATES, OR AS SPECIFIED IN SECTION 19-152 OF CANADIAN ELECTRICAL CODE FOR INSTALLATION IN CANADA.

CONNECTING TO EARTH GROUND

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

Each G306 has a chassis ground terminal on the back of the unit. Your unit should be connected to earth ground (protective earth).

The chassis ground is not connected to signal common of the unit. Maintaining isolation between earth ground and signal common is not required to operate your unit. But, other equipment connected to this unit may require isolation between signal common and earth ground. *To maintain isolation between signal common and earth ground care must be taken when connections are made to the unit.* For example, a power supply with isolation between its signal common and earth ground must be used. Also, plugging in a USB cable may connect signal common and earth ground.[1]

1. USB's shield may be connected to earth ground at the host. USB's shield in turn may also be connected to signal common.

POWER SUPPLY REQUIREMENTS

The G306 requires a 24 VDC power supply. Your unit may draw considerably less than the maximum rated power depending upon the options being used. As additional features are used your unit will draw increasing amounts of power. Items that could cause increases in current are additional communications, optional communications card, CompactFlash card, and other features programmed through Crimson.

In any case, it is very important that the power supply is mounted correctly if the unit is to operate reliably. Please take care to observe the following points:

- The power supply must be mounted close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the operator interface. Ideally, the shortest length possible should be used.
- The wire used to connect the operator interface's power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
- A power supply with a Class 2 or SELV rating is to be used. A Class 2 or SELV power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for "safety extra-low voltage." Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.

COMMUNICATING WITH THE G306

CONFIGURING A G306

The G306 is configured using Crimson software. Crimson is available as a free download from Red Lion's website, or it can be purchased on CD. Updates to Crimson for new features and drivers are posted on the website as they become available. By configuring the G306 using the latest version of Crimson, you are assured that your unit has the most up to date feature set. Crimson software can configure the G306 through the RS232 PGM port, USB port, or CompactFlash.

The USB port is connected using a standard USB cable with a Type B connector. The driver needed to use the USB port will be installed with Crimson.

The RS232 PGM port uses a programming cable made by Red Lion to connect to the DB9 COM port of your computer. If you choose to make your own cable, use the "G306 Port Pin Out Diagram" for wiring information.

The CompactFlash can be used to program a G3 by placing a configuration file and firmware on the CompactFlash card. The card is then inserted into the target G3 and powered. Refer to the Crimson literature for more information on the proper names and locations of the files.

USB, DATA TRANSFERS FROM THE COMPACTFLASH CARD

WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

In order to transfer data from the CompactFlash card via the USB port, a driver must be installed on your computer. This driver is installed with Crimson and is located in the folder C:\Program Files\Red Lion Controls\Crimson 2.0\Device\ after Crimson is installed. This may have already been accomplished if your G306 was configured using the USB port.

Once the driver is installed, connect the G306 to your PC with a USB cable, and follow "Mounting the CompactFlash" instructions in the Crimson 2 user manual.

CABLES AND DRIVERS

Red Lion has a wide range of cables and drivers for use with many different communication types. A list of these drivers and cables along with pin outs is available from Red Lion's website. New cables and drivers are added on a regular basis. If making your own cable, refer to the "G306 Port Pin Outs" for wiring information.

ETHERNET COMMUNICATIONS

Ethernet communications can be established at either 10 BASE-T or 100 BASE-TX. The G306 unit's RJ45 jack is wired as a NIC (Network Interface Card). For example, when wiring to a hub or switch use a straight-through cable, but when connecting to another NIC use a crossover cable.

The Ethernet connector contains two LEDs. A yellow LED in the upper right, and a bi-color green/amber LED in the upper left. The LEDs represent the following statuses:

LED COLOR	DESCRIPTION
YELLOW solid	Link established.
YELLOW flashing	Data being transferred.
GREEN	10 BASE-T Communications
AMBER	100 BASE-TX Communications

On the rear of each unit is a unique 12-digit MAC address and a block for marking the unit with an IP address. Refer to the Crimson manual and Red Lion's website for additional information on Ethernet communications.

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RS232 PORTS

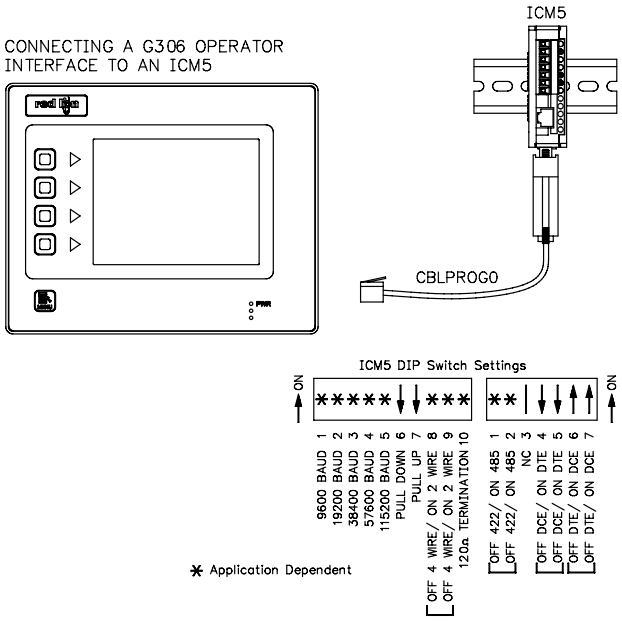
The G306 has two RS232 ports. There is the PGM port and the COMMS port. Although only one of these ports can be used for programming, both ports can be used for communications with a PLC.

The RS232 ports can be used for either master or slave protocols with any G306 configuration.

Examples of RS232 communications could involve another Red Lion product or a PC. By using a cable with RJ12 ends on it, and a twist in the cable, RS232 communications with another G3 product or the Modular Controller can be established. Red Lion part numbers for cables with a twist in them are CBLPROG0 [1], CBLRLC01 [2], or CBLRC02 [3].

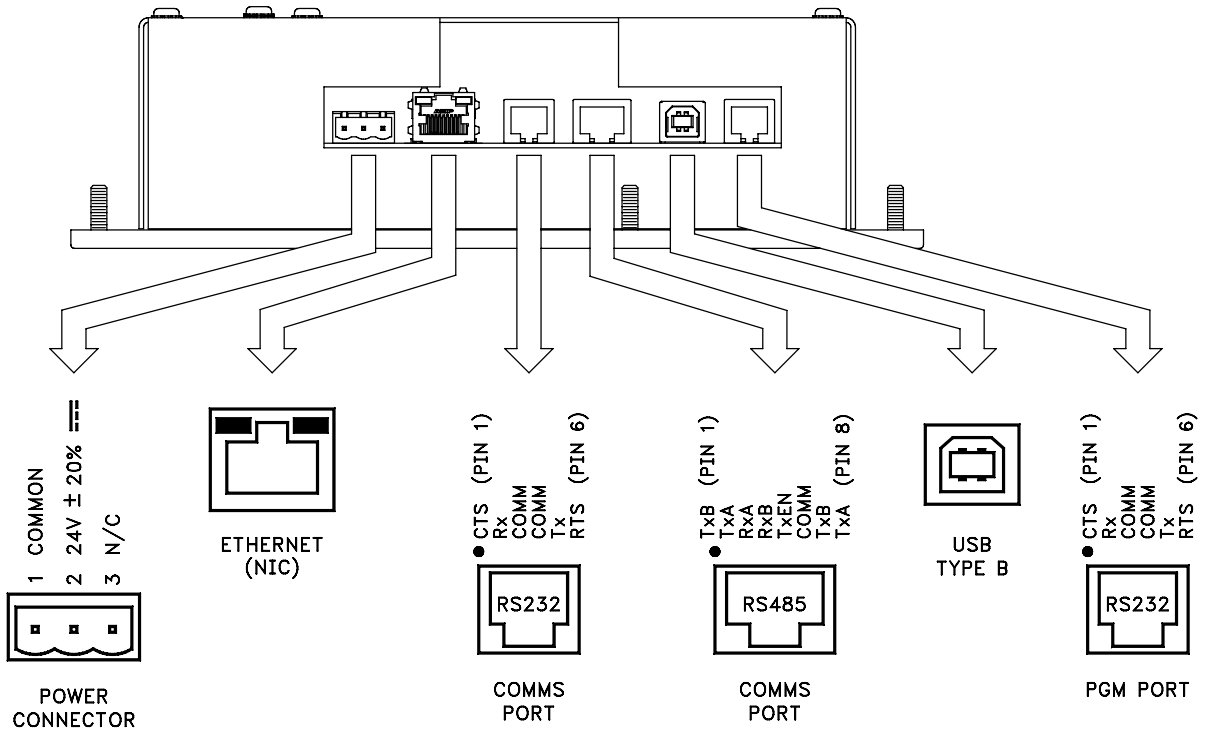
G3 RS232 to a PC

Connections			
G3: RJ12	Name	PC: DB9	Name
4	COMM	1	DCD
5	Tx	2	Rx
2	Rx	3	Tx
	N/C	4	DTR
3	COM	5	GND
	N/C	6	DSR
1	CTS	7	RTS
6	RTS	8	CTS
	N/C	9	RI



[1] CBLPROG0 can also be used to communicate with either a PC or an ICM5.
[2] DB9 adapter not included, 1 foot long.
[3] DB9 adapter not included, 10 feet long.

G306 PORT PIN OUTS



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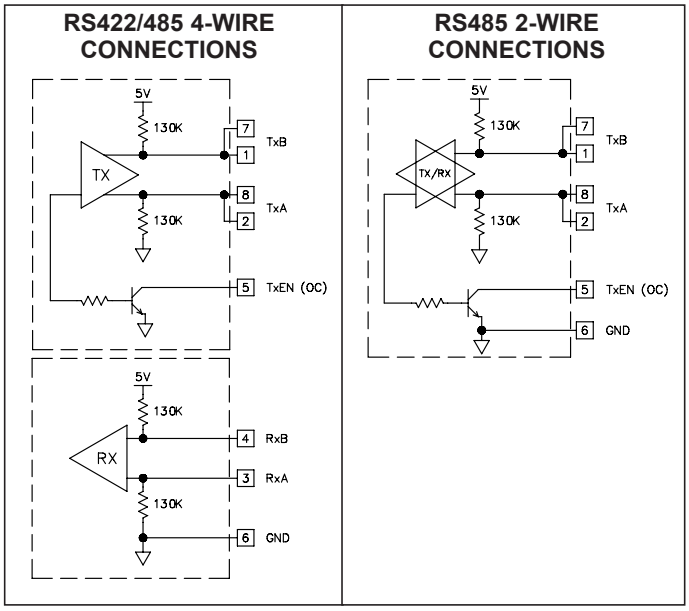
RS422/485 COMMS PORT

The G306 has one RS422/485 port. This port can be configured to act as either RS422 or RS485.



***Note**: All Red Lion devices connect A to A and B to B, except for Paradigm devices. Refer to www.redlion.net for additional information.*

DH485 COMMUNICATIONS

The G306's RS422/485 COMMS port can also be used for Allen Bradley DH485 communications.

WARNING: **DO NOT** use a standard DH485 cable to connect this port to Allen Bradley equipment. A cable and wiring diagram are available from Red Lion.

G3 to AB SLC 500 (CBLAB003)

Connections			
RJ45: RLC	Name	RJ45: A-B	Name
1	TxB	1	A
2	TxA	2	B
3, 8	RxA	-	24V
4, 7	RxB	-	COMM
5	TxEN	5	TxEN
6	COMM	4	SHIELD
4, 7	TxB	-	COMM
3, 8	TxA	-	24V

Examples of RS485 2-Wire Connections

G3 to Red Lion RJ11 (CBLRLC00) DLC, IAMS, ITMS, PAXCDC4C

Connections			
G3: RJ45	Name	RLC: RJ11	Name
5	TxEN	2	TxEN
6	COM	3	COM
1	TxB	5	B-
2	TxA	4	A+

G3 to Modular Controller (CBLRLC05)

Connections			
G3	Name	Modular Controller	Name
1,4	TxB	1,4	TxB
4,1	RxB	4,1	RxB
2,3	TxA	2,3	TxA
3,2	RxA	3,2	RxA
5	TxEN	5	TxEN
6	COM	6	COM
7	TxB	7	TxB
8	TxA	8	TxA

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SOFTWARE/UNIT OPERATION

CRIMSON® SOFTWARE

Crimson® software is available as a free download from Red Lion's website or it can be purchased on a CD, see "Ordering Information" for part number. The latest version of the software is always available from the website, and updating your copy is free.

DISPLAY

This operator interface uses a liquid crystal display (LCD) for displaying text and graphics. The display utilizes a white LED for lighting the display. The LEDs can be dimmed for low light conditions.

These LEDs have a limited lifetime. Backlight lifetime is based upon the amount of time the display is turned on at full intensity. Turning the backlight off when the display is not in use can extend the lifetime of your backlight. This can be accomplished through the Crimson software when configuring your unit.

FRONT PANEL LEDS

There are three front panel LEDs. Shown below is the default status of the LEDs.

LED	INDICATION
RED (TOP, LABELED "PWR")	
FLASHING	Unit is in the boot loader, no valid configuration is loaded.[1]
STEADY	Unit is powered and running an application.
YELLOW (MIDDLE)	
OFF	No CompactFlash card is present.
STEADY	Valid CompactFlash card present.
FLASHING RAPIDLY	CompactFlash card being checked.
FLICKERING	Unit is writing to the CompactFlash, either because it is storing data, or because the PC connected via the USB port has locked the drive.[2]
FLASHING SLOWLY	Incorrectly formatted CompactFlash card present.
GREEN (BOTTOM)	
FLASHING	A tag is in an alarm state.
STEADY	Valid configuration is loaded and there are no alarms present.

1. The operator interface is shipped without a configuration. After downloading a configuration, if the light remains in the flashing state continuously, try cycling power. If the LED still continues to flash, try downloading a configuration again.
2. Do not turn off power to the unit while this light is flickering. The unit writes data in two minute intervals. Later Microsoft operating systems will not lock the drive unless they need to write data; Windows 98 may lock the drive any time it is mounted, thereby interfering with logging. Refer to "Mounting the CompactFlash" in the Crimson 2 User Manual.

TOUCHSCREEN

This operator interface utilizes a resistive analog touchscreen for user input. The unit will only produce an audible tone (beep) when a touch on an active touchscreen cell is sensed. The touchscreen is fully functional as soon as the operator interface is initialized, and can be operated with gloved hands.

KEYPAD

The G306 keypad consists of five keys that can be used for on-screen menus.

TROUBLESHOOTING YOUR G306

If for any reason you have trouble operating, connecting, or simply have questions concerning your new G306, contact Red Lion's technical support. For contact information, refer to the back page of this bulletin for phone and fax numbers.

EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net

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BATTERY & TIME KEEPING

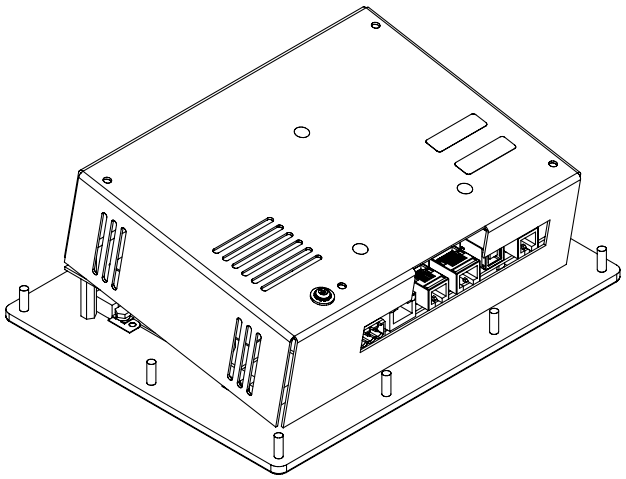
WARNING - EXPLOSION HAZARD - THE AREA MUST BE KNOWN TO BE NON-HAZARDOUS BEFORE SERVICING/ REPLACING THE UNIT AND BEFORE INSTALLING OR REMOVING I/O WIRING AND BATTERY.

WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN DISCONNECTED AND THE AREA IS KNOWN TO BE NON-HAZARDOUS.

A battery is used to keep time when the unit is without power. Typical accuracy of the G306 time keeping is less than one minute per month drift. The battery of a G306 unit does not affect the unit's memory, all configurations and data is stored in non-volatile memory.

CAUTION: The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

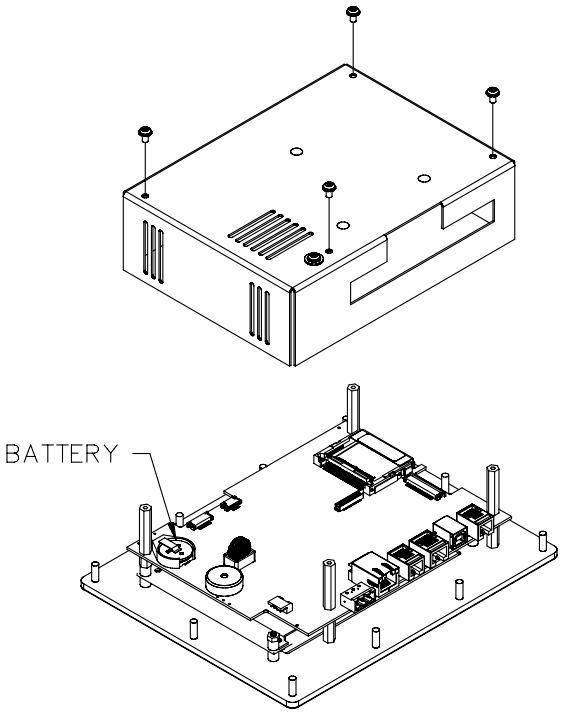
To change the battery of a G306, remove power, cabling, and then the rear cover of the unit. To remove the cover, remove the four screws designated by the arrows on the rear of the unit. Then, by lifting the top side, hinge the cover, thus providing clearance for the connectors on the bottom side of the PCB as shown in the illustration below. Install in the reverse manner.



Remove the old battery* from the holder and replace with the new battery. Replace the rear cover, cables, and re-apply power. Using Crimson or the unit's keypad, enter the correct time and date.

** Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. Also, the battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents come into contact with human skin.*

The battery used by the G306 is a lithium type CR2025.



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Optional Features and Accessories

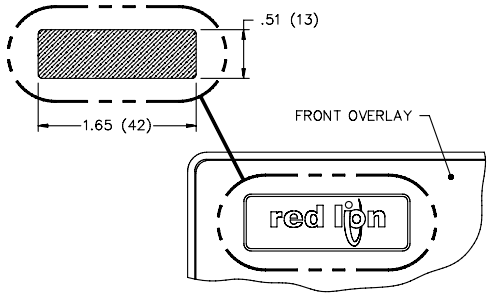
OPTIONAL COMMUNICATION CARD

Red Lion offers optional communication cards for fieldbus communications. These communication cards will allow your G306 to communicate with many of the popular fieldbus protocols.

Red Lion is also offering a communications card for additional RS232 and RS422/485 communications. Visit Red Lion's website for information and availability of these cards.

CUSTOM LOGO

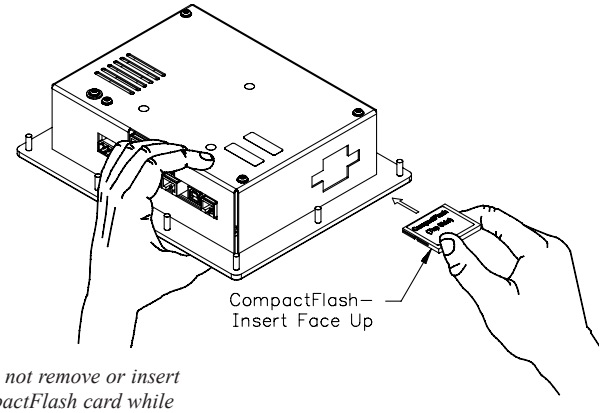
Each G3 operator interface has an embossed area containing the Red Lion logo. Red Lion can provide custom logos to apply to this area. Contact your distributor for additional information and pricing.



COMPACTFLASH SOCKET

CompactFlash socket is a Type II socket that can accept either Type I or II cards. Use cards with a minimum of 4 Mbytes and a maximum of 2 Gbytes with the G306's CompactFlash socket. Cards are available at most computer and office supply retailers.

CompactFlash can be used for configuration transfers, larger configurations, data logging, and trending.



Note: Do not remove or insert the CompactFlash card while power is applied. Refer to "Front Panel LEDs."

Information stored on a CompactFlash card by a G306 can be read by a card reader attached to a PC. This information is stored in IBM (Windows®) PC compatible FAT16 file format.

NOTE

For reliable operation in all of our products, Red Lion recommends the use of SanDisk® and SimpleTech brands of CompactFlash cards.

Industrial grade versions that provide up to two million write/erase cycles minimum are available from Red Lion.

LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

No warranties expressed or implied are created with respect to The Company's products except those expressly contained herein. The Customer acknowledges the disclaimers and limitations contained herein and relies on no other warranties or affirmations.

Red Lion Controls
20 Willow Springs Circle
York PA 17406
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839

Red Lion Controls BV
Printerweg 10
NL - 3821 AD Amersfoort
Tel +31 (0) 334 723 225
Fax +31 (0) 334 893 793

Red Lion Controls AP
Unit 101, XinAn Plaza
Building 13, No.99 Tianzhou Road
ShangHai, P.R. China 200223
Tel +86 21 6113-3688
Fax +86 21 6113-3683

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Tel +1 (717) 767-6511
Fax +1 (717) 764-0839
www.redlion.net

Bulletin No. G308-F
Drawing No. LP0580
Released 12/07

MODEL G308 - GRAPHIC LCD OPERATOR INTERFACE TERMINAL WITH VGA DISPLAY AND TOUCHSCREEN

- ***Configured using Crimson software*** *(version 2.0 or later)*
- ***Up to 5 RS-232/422/485 communications ports*** *(2 RS-232 and 1 RS-422/485 on board, 1 RS-232 and 1 RS422/485 on optional communications card)*
- ***10 Base T/100 Base-TX Ethernet Port*** *to network units and host web pages*
- ***USB Port*** *to download the unit's configuration from a PC or for data transfers to a PC*
- ***Unit's configuration is stored in non-volatile memory*** *(8Mbyte Flash)*
- ***CompactFlash® Socket*** *to increase memory capacity*
- ***7.7-inch DSTN Passive Matrix 256 Color VGA 640x480 pixel LCD module***
- ***7-button keypad*** *for on-screen menus*
- ***Three front panel LEDs***
- ***Power unit from 24VDC ±20% supply***
- ***Resistive Analog Touchscreen***

c UL US LISTED 63YN
LABORATORY EQUIPMENT

FOR USE IN HAZARDOUS LOCATIONS:
Class I, Division 2, Groups A, B, C, and D
Class II, Division 2, Groups F and G
Class III, Division 2

CE

GENERAL DESCRIPTION

The G308 Operator Interface Terminal combines unique capabilities normally expected from high-end units with a very affordable price. It is built around a high performance core with integrated functionality. This core allows the G308 to perform many of the normal features of the Paradigm range of Operator Interfaces while improving and adding new features.

The G308 is able to communicate with many different types of hardware using high-speed RS232/422/485 communications ports and Ethernet 10 Base T/100 Base-TX communications. In addition, the G308 features USB for fast downloads of configuration files and access to trending and data logging. A CompactFlash socket is provided so that Flash cards can be used to collect your trending and data logging information as well as to store larger configuration files.

In addition to accessing and controlling of external resources, the G308 allows a user to easily view and enter information. Users can enter data through the touchscreen or front panel 7-button keypad.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller.

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2/CLASS II, DIVISION 2/CLASS III, DIVISION 2

CAUTION: Risk Of Danger.
Read complete instructions prior to installation and operation of the unit.

CAUTION: Risk of electric shock.

CompactFlash is a registered trademark of CompactFlash Association.

CONTENTS OF PACKAGE

- G308 Operator Interface.
- Panel gasket.
- This hardware bulletin.
- Template for panel cutout.
- Hardware packet for mounting unit into panel.
- Terminal block for connecting power.

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
G308	Operator Interface for indoor applications, textured finish with embossed keys	G308C000
G3CF	64 MB CompactFlash Card [5]	G3CF064M
	256 MB CompactFlash Card [5]	G3CF256M
	512 MB CompactFlash Card [5]	G3CF512M
G3RS	RS232/485 Optional Communication Card	G3RS0000
G3CN	CANopen Optional Communication Card	G3CN0000
G3PBDP	Profibus DP Optional Communication Card	G3PBDP00
PSDR	Mini Power Supply 1 A	PSDR0100
SFCRM2	Crimson 2.0 [2]	SFCRM200
CBL	RS-232 Programming Cable	CBLPROG0
	USB Cable	CBLUSB00
	Communications Cables [1]	CBLxxxxx
DR	DIN Rail Mountable Adapter Products [3]	DRxxxxxx
	Replacement Battery [4]	BNL20000
G3FILM	Protective Films	G3FILM08

[1] Contact your Red Lion distributor or visit our website for complete selection.
[2] Use this part number to purchase Crimson on CD with a printed manual, USB cable, and RS-232 cable. Otherwise, download for free from www.redlion.net.
[3] Red Lion offers RJ modular jack adapters. Refer to the DR literature for complete details.
[4] Battery type is lithium coin type CR2025.
[5] Industrial grade 2 million write cycles.

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SPECIFICATIONS

1. **POWER REQUIREMENTS**:
+24 VDC ±20% @ 24 W max. Must use Class 2 or SELV rated power supply.
Power connection via removable three position terminal block.
Notes:
1. The front panel PWR LED indicates power.
2. The G308's circuit common is not connected to the enclosure of the unit. See "Connecting to Earth Ground" in the section "Installing and Powering the G308."
2. **BATTERY**: Lithium coin cell. Typical lifetime of 10 years.
3. **LCD MODULE DISPLAYS**:

SIZE	7.7-inch
TYPE	DSTN
COLORS	256 VGA
PIXELS	640 X 480
BRIGHTNESS	120 cd/m^2
BACKLIGHT*	40,000 HR TYP.

*Lifetime at room temperature. Refer to "Display" in "Software/Unit Operation"
4. **7-KEY KEYPAD**: for on-screen menus.
5. **TOUCHSCREEN**: Resistive analog
6. **MEMORY**:
On Board User Memory: 8 Mbyte of onboard non-volatile Flash memory.
Memory Card: CompactFlash Type II slot for Type I and Type II CompactFlash cards.
7. **COMMUNICATIONS**:
USB Port: Adheres to USB specification 1.1. Device only using Type B connection.

> WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

Serial Ports: Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
PGM Port: RS232 port via RJ12.
COMMS Ports: RS422/485 port via RJ45, and RS232 port via RJ12.
DH485 TXEN: Transmit enable; open collector, V_{OH} = 15 VDC, V_{OL} = 0.5 V @ 25 mA max.
Note: For additional information on the communications or signal common and connections to earth ground please see the "Connecting to Earth Ground" in the section "Installing and Powering the G308."
Ethernet Port: 10 BASE-T / 100 BASE-TX
RJ45 jack is wired as a NIC (Network Interface Card).
8. **ENVIRONMENTAL CONDITIONS**:
Operating Temperature Range: 0 to 50°C
Storage Temperature Range: -25 to 60°C
Operating and Storage Humidity: 80% maximum relative humidity (non-condensing) from 0 to 50°C.
Vibration According to IEC 68-2-6: 5 to 500 Hz, in X, Y, Z direction for 1.5 hours, 5 g's.
Shock According to IEC 68-2-27: Operational 40 g, 9 msec in 3 directions.
Altitude: Up to 2000 meters.
9. **CERTIFICATIONS AND COMPLIANCES**:
SAFETY
UL Recognized Component, File #E179259, UL61010-1, CSA 22.2 No. 61010-1
Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc
UL Listed, File #E211967, UL61010-1, UL1604, CSA 22.2 No. 61010.1, CSA 22.2 No. 213-M1987
LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
Type 4X Enclosure rating (Face only), UL50
IECEE CB Scheme Test Certificate #US/9737C/UL
CB Scheme Test Report #E179259-V01-S04
Issued by Underwriters Laboratories Inc.
IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
IP66 Enclosure rating (Face only), IEC 529
ELECTROMAGNETIC COMPATIBILITY
Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.

Immunity to Industrial Locations:

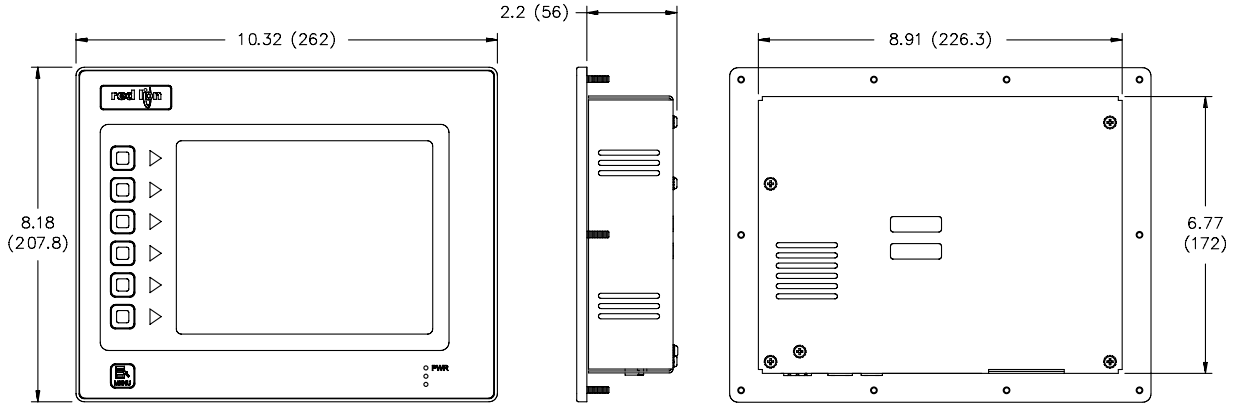
Electrostatic discharge	EN 61000-4-2	Criterion A 4 kV contact discharge 8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Criterion A 10 V/m
Fast transients (burst)	EN 61000-4-4	Criterion A 2 kV power 1 kV signal
Surge	EN 61000-4-5	Criterion A 1 kV L-L, 2 kV L&N-E power
RF conducted interference	EN 61000-4-6	Criterion B 3 V/rms

Emissions:

Emissions	EN 55011	Class A

Notes:
1. Criterion A: Normal operation within specified limits.
2. Criterion B: Temporary loss of performance from which the unit self-recovers.
10. **CONNECTIONS**: Compression cage-clamp terminal block.
Wire Gage: 12-30 AWG copper wire
Torque: 5-7 inch-pounds (56-79 N-cm)
11. **CONSTRUCTION**: Steel rear metal enclosure with NEMA 4X/IP66 aluminum front plate for indoor use only when correctly fitted with the gasket provided. Installation Category II, Pollution Degree 2.
12. **MOUNTING REQUIREMENTS**: Maximum panel thickness is 0.25" (6.3 mm). For NEMA 4X/IP66 sealing, a steel panel with a minimum thickness of 0.125" (3.17 mm) is recommended.
Maximum Mounting Stud Torque: 17 inch-pounds (1.92 N-m)
13. **WEIGHT**: 3.84 lbs (1.74 Kg)

DIMENSIONS In inches (mm)



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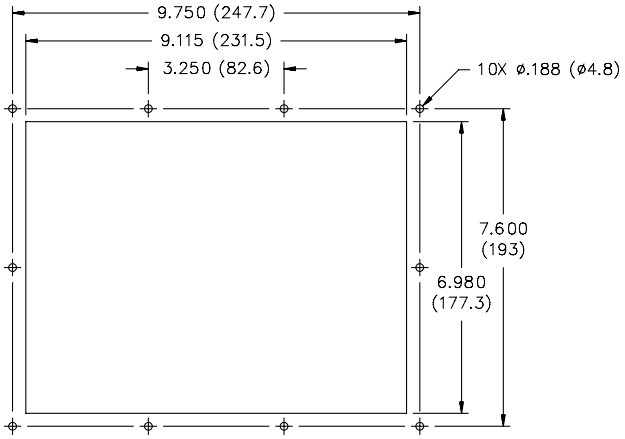
INSTALLING AND POWERING THE G308

MOUNTING INSTRUCTIONS

This operator interface is designed for through-panel mounting. A panel cut-out diagram and a template are provided. Care should be taken to remove any loose material from the mounting cut-out to prevent that material from falling into the operator interface during installation. A gasket is provided to enable sealing to NEMA 4X/IP66 specification. Install the ten kep nuts provided and tighten evenly for uniform gasket compression.

Note: Tightening the kep nuts beyond a maximum of 17 inch-pounds (1.92 N-m) may cause damage to the front panel.



All tolerances ±0.010" (±0.25 mm).

ALL NONINCENDIVE CIRCUITS MUST BE WIRED USING DIVISION 2 WIRING METHODS AS SPECIFIED IN ARTICLE 501-4 (b), 502-4 (b), AND 503-3 (b) OF THE NATIONAL ELECTRICAL CODE, NFPA 70 FOR INSTALLATION WITHIN THE UNITED STATES, OR AS SPECIFIED IN SECTION 19-152 OF CANADIAN ELECTRICAL CODE FOR INSTALLATION IN CANADA.

CONNECTING TO EARTH GROUND

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

Each G308 has a chassis ground terminal on the back of the unit. Your unit should be connected to earth ground (protective earth).

The chassis ground is not connected to signal common of the unit. Maintaining isolation between earth ground and signal common is not required to operate your unit. But, other equipment connected to this unit may require isolation between signal common and earth ground. *To maintain isolation between signal common and earth ground care must be taken when connections are made to the unit.* For example, a power supply with isolation between its signal common and earth ground must be used. Also, plugging in a USB cable may connect signal common and earth ground.[1]

1. USB's shield may be connected to earth ground at the host. USB's shield in turn may also be connected to signal common.

POWER SUPPLY REQUIREMENTS

The G308 requires a 24 VDC power supply rated at 24 W. Your unit may draw considerably less than 24 W depending upon the options being used. As additional features are used your unit will draw increasing amounts of power. Items that could cause increases in current are additional communications, optional communications card, CompactFlash card, and other features programmed through Crimson.

In any case, it is very important that the power supply is mounted correctly if the unit is to operate reliably. Please take care to observe the following points:

- The power supply must be mounted close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the operator interface. Ideally, the shortest length possible should be used.
- The wire used to connect the operator interface's power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
- A power supply with a Class 2 or SELV rating is to be used. A Class 2 or SELV power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for "safety extra-low voltage." Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.

COMMUNICATING WITH THE G308

CONFIGURING A G308

The G308 is configured using Crimson software. Crimson is available as a free download from Red Lion's website, or it can be purchased on CD. Updates to Crimson for new features and drivers are posted on the website as they become available. By configuring the G308 using the latest version of Crimson, you are assured that your unit has the most up to date feature set. Crimson software can configure the G308 through the RS232 PGM port, USB port, or CompactFlash.

The USB port is connected using a standard USB cable with a Type B connector. The driver needed to use the USB port will be installed with Crimson.

The RS232 PGM port uses a programming cable made by Red Lion to connect to the DB9 COM port of your computer. If you choose to make your own cable, use the "G308 Port Pin Out Diagram" for wiring information.

The CompactFlash can be used to program a G3 by placing a configuration file and firmware on the CompactFlash card. The card is then inserted into the target G3 and powered. Refer to the Crimson literature for more information on the proper names and locations of the files.

CABLES AND DRIVERS

Red Lion has a wide range of cables and drivers for use with many different communication types. A list of these drivers and cables along with pin outs is available from Red Lion's website. New cables and drivers are added on a regular basis. If making your own cable, refer to the "G308 Port Pin Outs" for wiring information.

USB, DATA TRANSFERS FROM THE COMPACTFLASH CARD

WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

In order to transfer data from the CompactFlash card via the USB port, a driver must be installed on your computer. This driver is installed with Crimson and is located in the folder C:\Program Files\Red Lion Controls\Crimson 2.0\Device\ after Crimson is installed. This may have already been accomplished if your G308 was configured using the USB port.

Once the driver is installed, connect the G308 to your PC with a USB cable, and follow "Mounting the CompactFlash" instructions in the Crimson 2 user manual.

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ETHERNET COMMUNICATIONS

Ethernet communications can be established at either 10 BASE-T or 100 BASE-TX. The G308 unit's RJ45 jack is wired as a NIC (Network Interface Card). For example, when wiring to a hub or switch use a straight-through cable, but when connecting to another NIC use a crossover cable.

The Ethernet connector contains two LEDs. A yellow LED in the upper right, and a bi-color green/amber LED in the upper left. The LEDs represent the following statuses:

LED COLOR	DESCRIPTION
YELLOW solid	Link established.
YELLOW flashing	Data being transferred.
GREEN	10 BASE-T Communications
AMBER	100 BASE-TX Communications

The Crimson manual contains additional information on Ethernet communications

RS232 PORTS

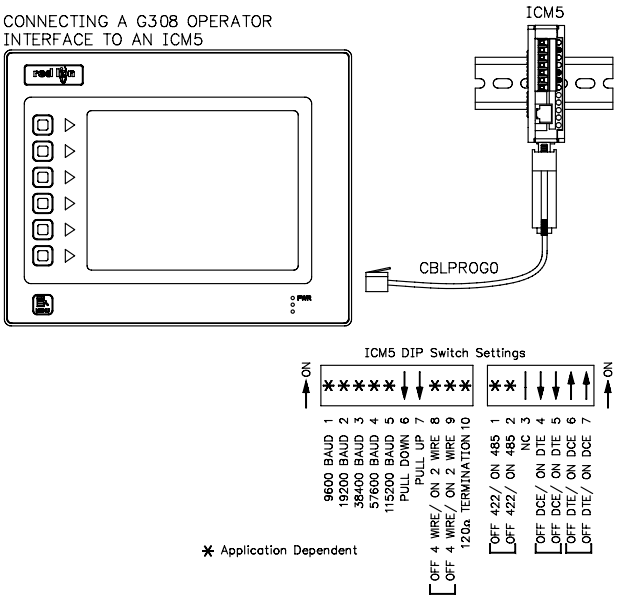
The G308 has two RS232 ports. There is the PGM port and the COMMS port. Although only one of these ports can be used for programming, both ports can be used for communications with a PLC.

The RS232 ports can be used for either master or slave protocols with any G308 configuration.

Examples of RS232 communications could involve another Red Lion product or a PC. By using a cable with RJ12 ends on it, and a twist in the cable, RS232 communications with another G3 product or the Modular Controller can be established. Red Lion part numbers for cables with a twist in them are CBLPROG0 [1], CBLRLC01 [2], or CBLRC02 [3].

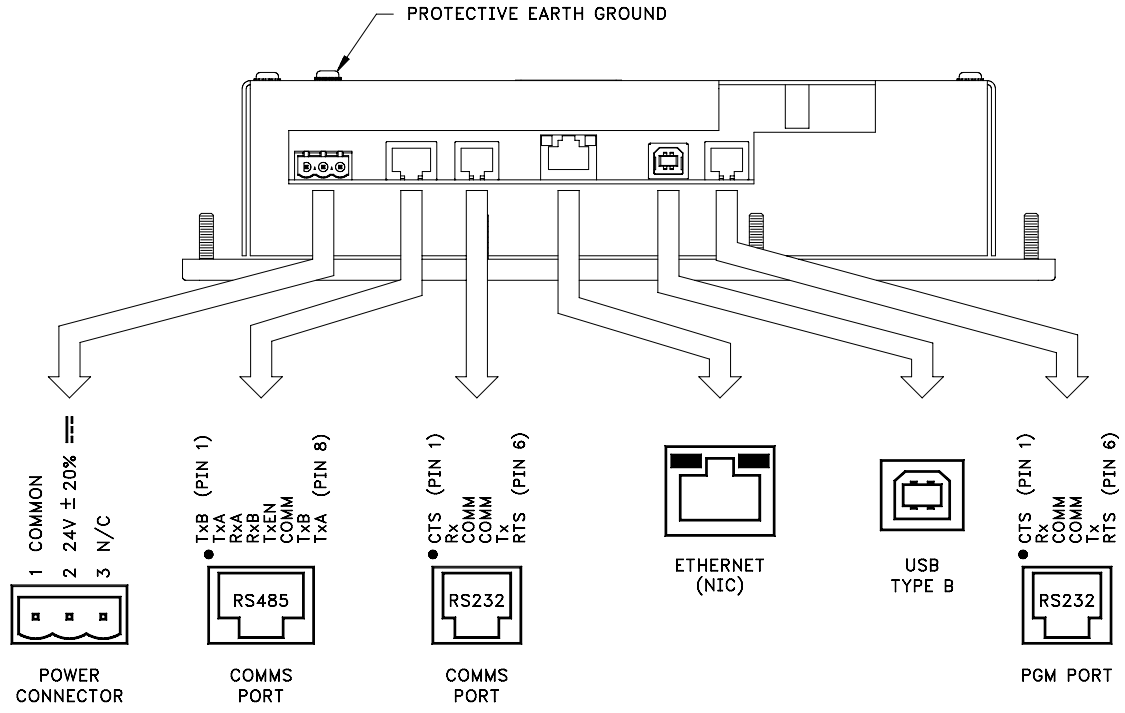
G3 RS232 to a PC

Connections			
G3: RJ12	Name	PC: DB9	Name
4	COMM	1	DCD
5	Tx	2	Rx
2	Rx	3	Tx
	N/C	4	DTR
3	COM	5	GND
	N/C	6	DSR
1	CTS	7	RTS
6	RTS	8	CTS
	N/C	9	RI



[1] CBLPROG0 can also be used to communicate with either a PC or an ICM5.
[2] DB9 adapter not included, 1 foot long.
[3] DB9 adapter not included, 10 feet long.

G308 PORT PIN OUTS



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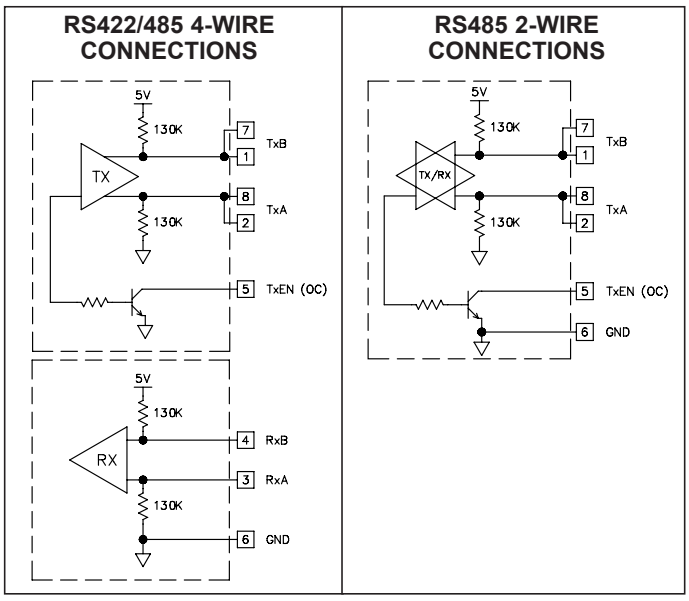
RS422/485 COMMS PORT

The G308 has one RS422/485 port. This port can be configured to act as either RS422 or RS485.



***Note**: All Red Lion devices connect A to A and B to B, except for Paradigm devices. Refer to www.redlion.net for additional information.*

DH485 COMMUNICATIONS

The G308's RS422/485 COMMS port can also be used for Allen Bradley DH485 communications.

WARNING: **DO NOT** use a standard DH485 cable to connect this port to Allen Bradley equipment. A cable and wiring diagram are available from Red Lion.

G3 to AB SLC 500 (CBLAB003)

Connections			
RJ45: RLC	Name	RJ45: A-B	Name
1	TxB	1	A
2	TxA	2	B
3, 8	RxA	-	24V
4, 7	RxB	-	COMM
5	TxEN	5	TxEN
6	COMM	4	SHIELD
4, 7	TxB	-	COMM
3, 8	TxA	-	24V

Examples of RS485 2-Wire Connections

G3 to Red Lion RJ11 (CBLRLC00) DLC, IAMS, ITMS, PAXCDC4C

Connections			
G3: RJ45	Name	RLC: RJ11	Name
5	TxEN	2	TxEN
6	COM	3	COM
1	TxB	5	B-
2	TxA	4	A+

G3 to Modular Controller (CBLRLC05)

Connections			
G3	Name	Modular Controller	Name
1,4	TxB	1,4	TxB
4,1	RxB	4,1	RxB
2,3	TxA	2,3	TxA
3,2	RxA	3,2	RxA
5	TxEN	5	TxEN
6	COM	6	COM
7	TxB	7	TxB
8	TxA	8	TxA

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SOFTWARE/UNIT OPERATION

CRIMSON SOFTWARE

Crimson software is available as a free download from Red Lion's website or it can be purchased on a CD, see "Ordering Information" for part number. The latest version of the software is always available from the website, and updating your copy is free.

DISPLAY

This operator interface uses a liquid crystal display (LCD) for displaying text and graphics. The display utilizes a cold cathode fluorescent tube (CCFL) for lighting the display. The CCFL tubes can be dimmed for low light conditions.

These CCFL tubes have a limited lifetime. Backlight lifetime is based upon the amount of time the display is turned on at full intensity. Turning the backlight off when the display is not in use can extend the lifetime of your backlight. This can be accomplished through the Crimson software when configuring your unit.

FRONT PANEL LEDS

There are three front panel LEDs. Shown below is the default status of the LEDs.

LED	INDICATION
RED (TOP, LABELED "PWR")	
FLASHING	Unit is in the boot loader, no valid configuration is loaded.[1]
STEADY	Unit is powered and running an application.
YELLOW (MIDDLE)	
OFF	No CompactFlash card is present.
STEADY	Valid CompactFlash card present.
FLASHING RAPIDLY	CompactFlash card being checked.
FLICKERING	Unit is writing to the CompactFlash, either because it is storing data, or because the PC connected via the USB port has locked the drive.[2]
FLASHING SLOWLY	Incorrectly formatted CompactFlash card present.
GREEN (BOTTOM)	
FLASHING	A tag is in an alarm state.
STEADY	Valid configuration is loaded and there are no alarms present.

1. The operator interface is shipped without a configuration. After downloading a configuration, if the light remains in the flashing state continuously, try cycling power. If the LED still continues to flash, try downloading a configuration again.
2. Do not turn off power to the unit while this light is flickering. The unit writes data in two minute intervals. Later Microsoft operating systems will not lock the drive unless they need to write data; Windows 98 may lock the drive any time it is mounted, thereby interfering with logging. Refer to "Mounting the CompactFlash" in the Crimson 2 User Manual.

TOUCHSCREEN

This operator interface utilizes a resistive analog touchscreen for user input. The unit will only produce an audible tone (beep) when a touch on an active touchscreen cell is sensed. The touchscreen is fully functional as soon as the operator interface is initialized, and can be operated with gloved hands.

KEYPAD

The G308 keypad consists of seven keys that can be used for on-screen menus.

TROUBLESHOOTING YOUR G308

If for any reason you have trouble operating, connecting, or simply have questions concerning your new G308, contact Red Lion's technical support. For contact information, refer to the back page of this bulletin for phone and fax numbers.

EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net

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BATTERY & TIME KEEPING

WARNING - EXPLOSION HAZARD - THE AREA MUST BE KNOWN TO BE NON-HAZARDOUS BEFORE SERVICING/ REPLACING THE UNIT AND BEFORE INSTALLING OR REMOVING I/O WIRING AND BATTERY.

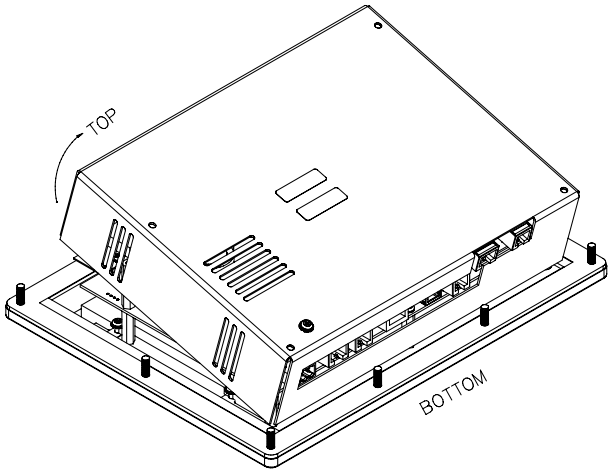
WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN DISCONNECTED AND THE AREA IS KNOWN TO BE NON-HAZARDOUS.

A battery is used to keep time when the unit is without power. Typical accuracy of the G308 time keeping is less than one minute per month drift. The battery of a G308 unit does not affect the unit's memory, all configurations and data is stored in non-volatile memory.

CAUTION: RISK OF ELECTRIC SHOCK
The inverter board, attached to the mounting plate, supplies the high voltage to operate the backlight. Touching the inverter board may result in injury to personnel.

CAUTION: The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

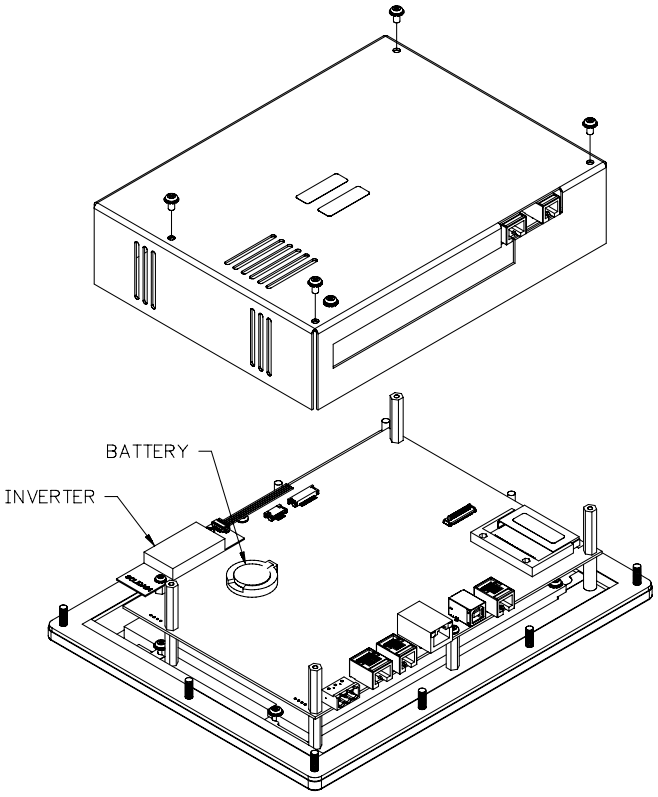
To change the battery of a G308, remove power, cabling, and then the rear cover of the unit. To remove the cover, remove the four screws designated by the arrows on the rear of the unit. Then, by lifting the top side, hinge the cover, thus providing clearance for the connectors on the bottom side of the PCB as shown in the illustration below. Install in the reverse manner.



Remove the old battery* from the holder and replace with the new battery. Replace the rear cover, cables, and re-apply power. Using Crimson or the unit's keypad, enter the correct time and date.

** Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. Also, the battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents come into contact with human skin.*

The battery used by the G308 is a lithium type CR2025.



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Optional Features and Accessories

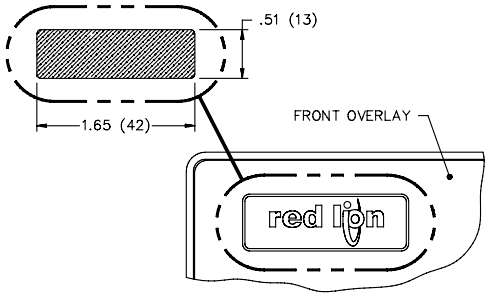
OPTIONAL COMMUNICATION CARD

Red Lion offers optional communication cards for fieldbus communications. These communication cards will allow your G308 to communicate with many of the popular fieldbus protocols.

Red Lion is also offering a communications card for additional RS232 and RS422/485 communications. Visit Red Lion's website for information and availability of these cards.

CUSTOM LOGO

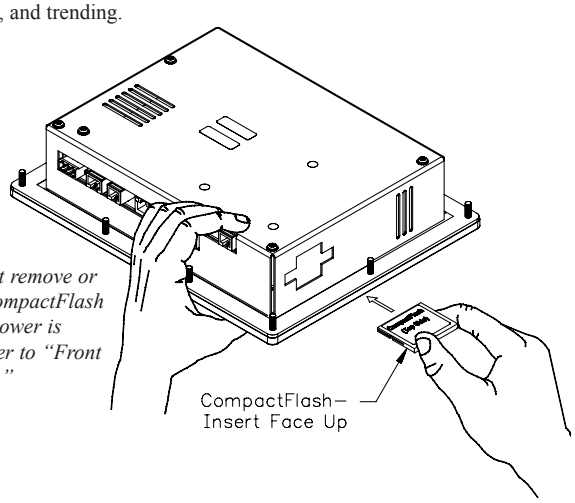
Each G3 operator interface has an embossed area containing the Red Lion logo. Red Lion can provide custom logos to apply to this area. Contact your distributor for additional information and pricing.



COMPACTFLASH SOCKET

CompactFlash socket is a Type II socket that can accept either Type I or II cards. Use cards with a minimum of 4 Mbytes and a maximum of 2 Gbytes with the G308's CompactFlash socket. Cards are available at most computer and office supply retailers.

CompactFlash can be used for configuration transfers, larger configurations, data logging, and trending.



Note: Do not remove or insert the CompactFlash card while power is applied. Refer to "Front Panel LEDs."

Information stored on a CompactFlash card by a G308 can be read by a card reader attached to a PC. This information is stored in IBM (Windows®) PC compatible FAT16 file format.

NOTE

For reliable operation in all of our products, Red Lion recommends the use of SanDisk® and SimpleTech brands of CompactFlash cards.

Industrial grade versions that provide up to two million write/erase cycles minimum are available from Red Lion.

LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

No warranties expressed or implied are created with respect to The Company's products except those expressly contained herein. The Customer acknowledges the disclaimers and limitations contained herein and relies on no other warranties or affirmations.

Red Lion Controls
20 Willow Springs Circle
York PA 17406
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839

Red Lion Controls BV
Printerweg 10
NL - 3821 AD Amersfoort
Tel +31 (0) 334 723 225
Fax +31 (0) 334 893 793

Red Lion Controls AP
Unit 101, XinAn Plaza
Building 13, No.99 Tianzhou Road
ShangHai, P.R. China 200223
Tel +86 21 6113-3688
Fax +86 21 6113-3683

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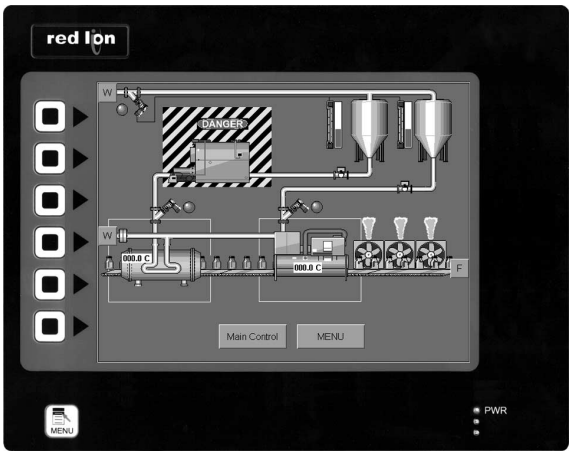
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839
www.redlion.net

Bulletin No. G308A-E
Drawing No. LP0613
Released 1/08

MODEL G308A - GRAPHIC LCD OPERATOR INTERFACE TERMINAL WITH VGA DISPLAY AND TOUCHSCREEN



- *CONFIGURED USING CRIMSON SOFTWARE (VERSION 2.0 BUILD 187 OR LATER)*
- *UP TO 5 RS-232/422/485 COMMUNICATIONS PORTS (2 RS-232 AND 1 RS-422/485 ON BOARD, 1 RS-232 AND 1 RS422/485 ON OPTIONAL COMMUNICATIONS CARD)*
- *10 BASE T/100 BASE-TX ETHERNET PORT TO NETWORK UNITS AND HOST WEB PAGES*
- *USB PORT TO DOWNLOAD THE UNIT'S CONFIGURATION FROM A PC OR FOR DATA TRANSFERS TO A PC*
- *UNIT'S CONFIGURATION IS STORED IN NON-VOLATILE MEMORY (8 MBYTE FLASH)*
- *COMPACTFLASH® SOCKET TO INCREASE MEMORY CAPACITY*
- *8.4-INCH TFT DISPLAY (256 COLOR, VGA 640X480 PIXELS)*
- *7-BUTTON KEYPAD FOR ON-SCREEN MENUS*
- *THREE FRONT PANEL LEDS*
- *POWER UNIT FROM 24VDC ±20% SUPPLY*
- *RESISTIVE ANALOG TOUCHSCREEN*

c UL us LISTED 63YN
LABORATORY EQUIPMENT

FOR USE IN HAZARDOUS LOCATIONS:
Class I, Division 2, Groups A, B, C, and D
Class II, Division 2, Groups F and G
Class III, Division 2

GENERAL DESCRIPTION

The G308 Operator Interface Terminal combines unique capabilities normally expected from high-end units with a very affordable price. It is built around a high performance core with integrated functionality. This core allows the G308 to perform many of the normal features of the Paradigm range of Operator Interfaces while improving and adding new features.

The G308 is able to communicate with many different types of hardware using high-speed RS232/422/485 communications ports and Ethernet 10 Base T/100 Base-TX communications. In addition, the G308 features USB for fast downloads of configuration files and access to trending and data logging. A CompactFlash socket is provided so that Flash cards can be used to collect your trending and data logging information as well as to store larger configuration files.

In addition to accessing and controlling of external resources, the G308 allows a user to easily view and enter information. Users can enter data through the touchscreen or front panel 7-button keypad.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller.

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2/CLASS II, DIVISION 2/CLASS III, DIVISION 2

CAUTION: Risk of Danger
Read complete instructions prior to installationand operation of the unit.

CAUTION: Risk of electric shock.

CompactFlash is a registered trademark of CompactFlash Association.

CONTENTS OF PACKAGE

- G308 Operator Interface.
- Panel gasket.
- Template for panel cutout.
- Hardware packet for mounting unit into panel.
- Terminal block for connecting power.

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
G308A	Operator Interface with TFT display for indoor applications, textured finish with embossed keys	G308A000
G3CF	64 MB CompactFlash Card [5]	G3CF064M
	256 MB CompactFlash Card [5]	G3CF256M
	512 MB CompactFlash Card [5]	G3CF512M
G3RS	RS232/485 Optional Communication Card	G3RS0000
G3CN	CANopen Optional Communication Card	G3CN0000
G3PBDP	Profibus DP Optional Communication Card	G3PBDP00
PSDR	Mini Power Supply 1 A	PSDR0100
SFCRM2	Crimson 2.0 [2]	SFCRM200
CBL	RS-232 Programming Cable	CBLPROG0
	USB Cable	CBLUSB00
	Communications Cables [1]	CBLxxxxx
DR	DIN Rail Mountable Adapter Products [3]	DRxxxxxx
	Replacement Battery [4]	BNL20000
G3FILM	Protective Films	G3FILM08

[1] Contact your Red Lion distributor or visit our website for complete selection.
[2] Use this part number to purchase Crimson on CD with a printed manual, USB cable, and RS-232 cable. Otherwise, download from www.redlion.net.
[3] Red Lion offers RJ modular jack adapters. Refer to the DR literature for complete details.
[4] Battery type is lithium coin type CR2025.
[5] Industrial grade two million write cycles.

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SPECIFICATIONS

1. **POWER REQUIREMENTS**:
   +24 VDC ±20% @ 24 W maximum. Must use Class 2 or SELV rated power supply.
   Power connection via removable three position terminal block.
   Notes:
   1. The front panel PWR LED indicates power.
   2. The G308's circuit common is not connected to the enclosure of the unit. See "Connecting to Earth Ground" in the section "Installing and Powering the G308."
2. **BATTERY**: Lithium coin cell. Typical lifetime of 10 years.
3. **DISPLAY**:

	G308A
SIZE	8.4-inch
TYPE	TFT Active Matrix
COLORS	256
PIXELS	640 X 480 (VGA)
BRIGHTNESS	450 cd/m^2
BACKLIGHT*	40,000 HR TYP.

*Lifetime at room temperature. Refer to "Display" in "Software/Unit Operation"

4. **7-KEY KEYPAD**: for on-screen menus.
5. **TOUCHSCREEN**: Resistive analog
6. **MEMORY**:
   On Board User Memory: 8 Mbyte of onboard non-volatile Flash memory.
   Memory Card: CompactFlash Type II slot for Type I and Type II CompactFlash cards.
7. **COMMUNICATIONS**:
   USB Port: Adheres to USB specification 1.1. Device only using Type B connection.

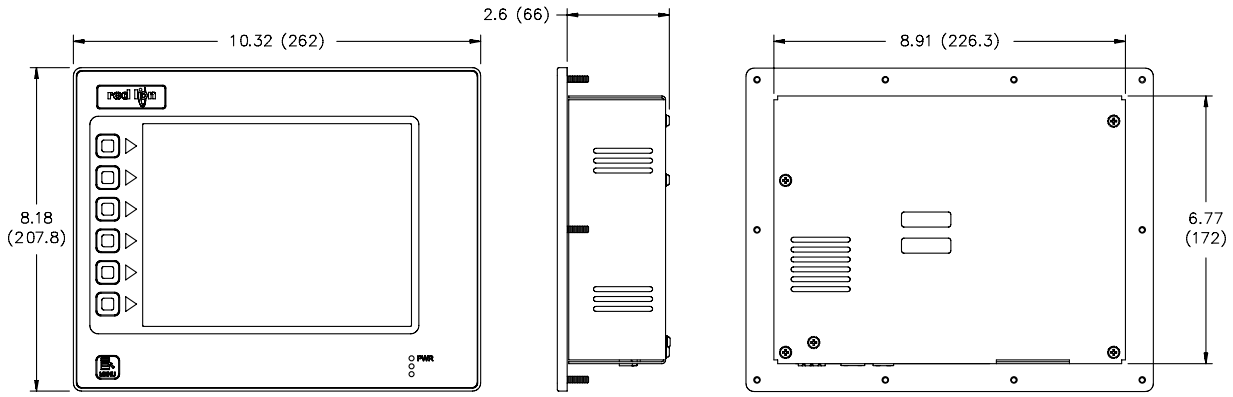
> WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

   Serial Ports: Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
   PGM Port: RS232 port via RJ12.
   COMMS Ports: RS422/485 port via RJ45, and RS232 port via RJ12.
   DH485 TXEN: Transmit enable; open collector, V_{OH} = 15 VDC, V_{OL} = 0.5 V @ 25 mA max.
   Note: For additional information on the communications or signal common and connections to earth ground please see the "Connecting to Earth Ground" in the section "Installing and Powering the G308."
   Ethernet Port: 10 BASE-T / 100 BASE-TX
   RJ45 jack is wired as a NIC (Network Interface Card).
8. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: 0 to 50°C
   Storage Temperature Range: -20 to 60°C
   Operating and Storage Humidity: 80% maximum relative humidity (non-condensing) from 0 to 50°C.
   Vibration According to IEC 68-2-6: Operational 10 to 55 Hz, in X, Y, Z direction for 1.5 hours, 1 g.
   Shock According to IEC 68-2-27: Operational 30 g's, 9 msec in 3 directions.
   Altitude: Up to 2000 meters.
9. **CERTIFICATIONS AND COMPLIANCES**:
   SAFETY
   UL Recognized Component, File #E179259, UL61010-1, CSA 22.2 No. 61010-1
   Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc
   Type 4X Enclosure rating (Face only), UL50
   UL Listed, File #E211967, UL61010-1, UL1604, CSA 22.2 No. 61010.1, CSA 22.2 No. 213-M1987
   LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
   IECEE CB Scheme Test Certificate #US/9737C/UL
   CB Scheme Test Report #E179259-V01-S04
   Issued by Underwriters Laboratories Inc.
   IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
   IP66 Enclosure rating (Face only), IEC 529
   ELECTROMAGNETIC COMPATIBILITY
   Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.

Immunity to Industrial Locations:		
Electrostatic discharge	EN 61000-4-2	Criterion A 4 kV contact discharge 8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Criterion A 10 V/m
Fast transients (burst)	EN 61000-4-4	Criterion A 2 kV power 1 kV signal
Surge	EN 61000-4-5	Criterion A 1 kV L-L, 2 kV L&N-E power
RF conducted interference	EN 61000-4-6	Criterion B 3 V/rms
Emissions:		
Emissions	EN 55011	Class A

   Notes:
   1. Criterion A: Normal operation within specified limits.
   2. Criterion B: Temporary loss of performance from which the unit self-recovers.
10. **CONNECTIONS**: Compression cage-clamp terminal block.
    Wire Gage: 12-30 AWG copper wire
    Torque: 5-7 inch-pounds (56-79 N-cm)
11. **CONSTRUCTION**: Steel rear metal enclosure with NEMA 4X/IP66 aluminum front plate for indoor use only when correctly fitted with the gasket provided. Installation Category II, Pollution Degree 2.
12. **MOUNTING REQUIREMENTS**: Maximum panel thickness is 0.25" (6.3 mm). For NEMA 4X/IP66 sealing, a steel panel with a minimum thickness of 0.125" (3.17 mm) is recommended.
    Maximum Mounting Stud Torque: 17 inch-pounds (1.92 N-m)
13. **WEIGHT**: 4.20 lbs (1.91 Kg)

DIMENSIONS In inches (mm)



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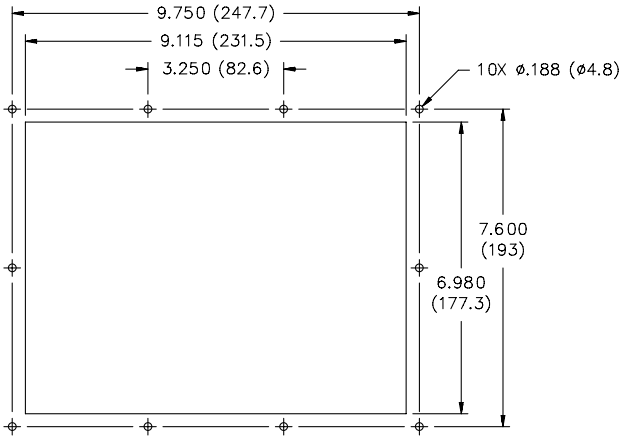
Installing and Powering the G308

MOUNTING INSTRUCTIONS

This operator interface is designed for through-panel mounting. A panel cut-out diagram and a template are provided. Care should be taken to remove any loose material from the mounting cut-out to prevent that material from falling into the operator interface during installation. A gasket is provided to enable sealing to NEMA 4X/IP66 specification. Install the ten kep nuts provided and tighten evenly for uniform gasket compression.

Note: Tightening the kep nuts beyond a maximum of 17 inch-pounds (1.92 N-m) may cause damage to the front panel.



All tolerances ±0.010" (±0.25 mm).

ALL NONINCENDIVE CIRCUITS MUST BE WIRED USING DIVISION 2 WIRING METHODS AS SPECIFIED IN ARTICLE 501-4 (b), 502-4 (b), AND 503-3 (b) OF THE NATIONAL ELECTRICAL CODE, NFPA 70 FOR INSTALLATION WITHIN THE UNITED STATES, OR AS SPECIFIED IN SECTION 19-152 OF CANADIAN ELECTRICAL CODE FOR INSTALLATION IN CANADA.

CONNECTING TO EARTH GROUND

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

Each G308 has a chassis ground terminal on the back of the unit. Your unit should be connected to earth ground (protective earth).

The chassis ground is not connected to signal common of the unit. Maintaining isolation between earth ground and signal common is not required to operate your unit. But, other equipment connected to this unit may require isolation between signal common and earth ground. *To maintain isolation between signal common and earth ground care must be taken when connections are made to the unit.* For example, a power supply with isolation between its signal common and earth ground must be used. Also, plugging in a USB cable may connect signal common and earth ground.[1]

1. USB's shield may be connected to earth ground at the host. USB's shield in turn may also be connected to signal common.

POWER SUPPLY REQUIREMENTS

The G308 requires a 24 VDC power supply rated at 24 W. Your unit may draw considerably less than 24 W depending upon the options being used. As additional features are used your unit will draw increasing amounts of power. Items that could cause increases in current are additional communications, optional communications card, CompactFlash card, and other features programmed through Crimson.

In any case, it is very important that the power supply is mounted correctly if the unit is to operate reliably. Please take care to observe the following points:

- The power supply must be mounted close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the operator interface. Ideally, the shortest length possible should be used.
- The wire used to connect the operator interface's power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
- A power supply with a Class 2 or SELV rating is to be used. A Class 2 or SELV power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for "safety extra-low voltage." Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.

Communicating With the G308

CONFIGURING A G308

The G308 is configured using Crimson software. Crimson is available as a free download from Red Lion's website, or it can be purchased on CD. Updates to Crimson for new features and drivers are posted on the website as they become available. By configuring the G308 using the latest version of Crimson, you are assured that your unit has the most up to date feature set. Crimson software can configure the G308 through the RS232 PGM port, USB port, or CompactFlash.

The USB port is connected using a standard USB cable with a Type B connector. The driver needed to use the USB port will be installed with Crimson.

The RS232 PGM port uses a programming cable made by Red Lion to connect to the DB9 COM port of your computer. If you choose to make your own cable, use the "G308 Port Pin Out Diagram" for wiring information.

The CompactFlash can be used to program a G3 by placing a configuration file and firmware on the CompactFlash card. The card is then inserted into the target G3 and powered. Refer to the Crimson literature for more information on the proper names and locations of the files.

CABLES AND DRIVERS

Red Lion has a wide range of cables and drivers for use with many different communication types. A list of these drivers and cables along with pin outs is available from Red Lion's website. New cables and drivers are added on a regular basis. If making your own cable, refer to the "G308 Port Pin Outs" for wiring information.

USB, DATA TRANSFERS FROM THE COMPACTFLASH CARD

WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

In order to transfer data from the CompactFlash card via the USB port, a driver must be installed on your computer. This driver is installed with Crimson and is located in the folder C:\Program Files\Red Lion Controls\Crimson 2.0\Device\ after Crimson is installed. This may have already been accomplished if your G308 was configured using the USB port.

Once the driver is installed, connect the G308 to your PC with a USB cable, and follow "Mounting the CompactFlash" instructions in the Crimson 2 user manual.

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ETHERNET COMMUNICATIONS

Ethernet communications can be established at either 10 BASE-T or 100 BASE-TX. The G308 unit's RJ45 jack is wired as a NIC (Network Interface Card). For example, when wiring to a hub or switch use a straight-through cable, but when connecting to another NIC use a crossover cable.

The Ethernet connector contains two LEDs. A yellow LED in the upper right, and a bi-color green/amber LED in the upper left. The LEDs represent the following statuses:

LED COLOR	DESCRIPTION
YELLOW solid	Link established
YELLOW flashing	Data being transferred
GREEN	10 BASE-T Communications
AMBER	100 BASE-TX Communications

The Crimson manual contains additional information on Ethernet communications.

RS232 PORTS

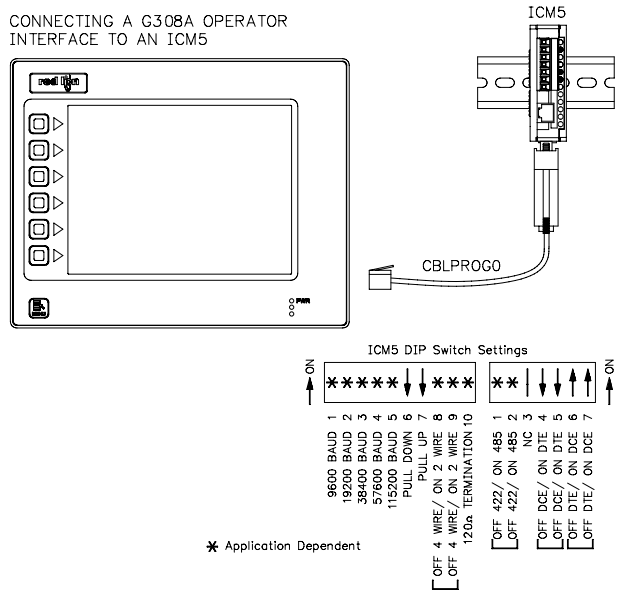
The G308 has two RS232 ports. There is the PGM port and the COMMS port. Although only one of these ports can be used for programming, both ports can be used for communications with a PLC.

The RS232 ports can be used for either master or slave protocols with any G308 configuration.

Examples of RS232 communications could involve another Red Lion product or a PC. By using a cable with RJ12 ends on it, and a twist in the cable, RS232 communications with another G3 product or the Modular Controller can be established. Red Lion part numbers for cables with a twist in them are CBLPROG0 [1], CBLRLC01 [2], or CBLRC02 [3].

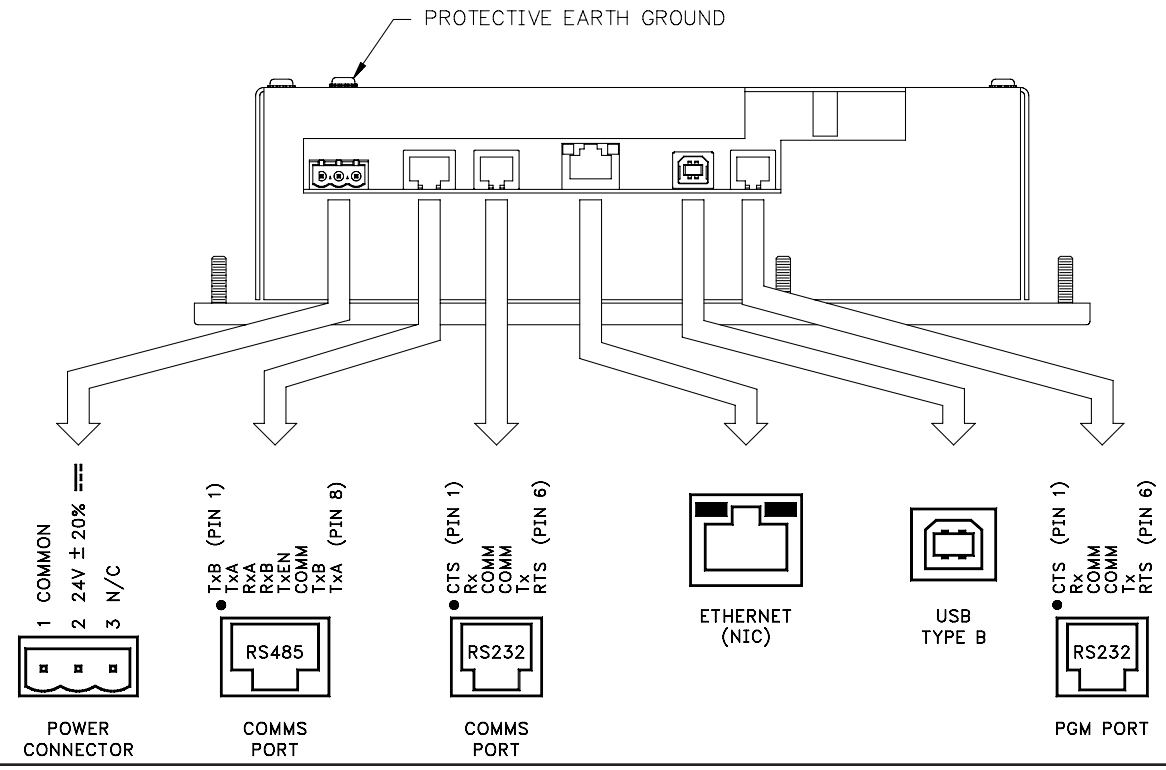
G3 RS232 to a PC

Connections			
G3: RJ12	Name	PC: DB9	Name
4	COMM	1	DCD
5	Tx	2	Rx
2	Rx	3	Tx
	N/C	4	DTR
3	COM	5	GND
	N/C	6	DSR
1	CTS	7	RTS
6	RTS	8	CTS
	N/C	9	RI



[1] CBLPROG0 can also be used to communicate with either a PC or an ICM5.
[2] DB9 adapter not included, 1 foot long.
[3] DB9 adapter not included, 10 feet long.

G308 PORT PIN OUTS



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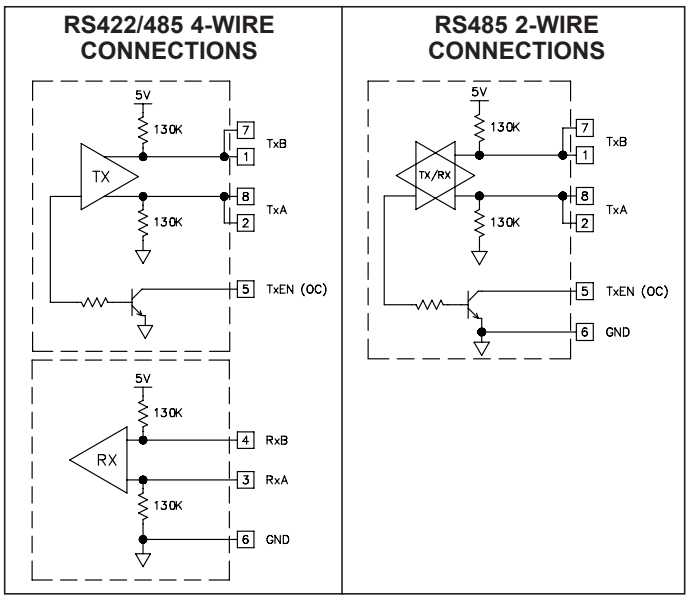
RS422/485 COMMS PORT

The G308 has one RS422/485 port. This port can be configured to act as either RS422 or RS485.



***Note**: All Red Lion devices connect A to A and B to B, except for Paradigm devices. Refer to www.redlion.net for additional information.*

DH485 COMMUNICATIONS

The G308's RS422/485 COMMS port can also be used for Allen Bradley DH485 communications.

WARNING: **DO NOT** use a standard DH485 cable to connect this port to Allen Bradley equipment. A cable and wiring diagram are available from Red Lion.

G3 to AB SLC 500 (CBLAB003)

Connections			
RJ45: RLC	Name	RJ45: A-B	Name
1	TxB	1	A
2	TxA	2	B
3, 8	RxA	-	24V
4, 7	RxB	-	COMM
5	TxEN	5	TxEN
6	COMM	4	SHIELD
4, 7	TxB	-	COMM
3, 8	TxA	-	24V

Examples of RS485 2-Wire Connections

G3 to Red Lion RJ11 (CBLRLC00) DLC, IAMS, ITMS, PAXCDC4C

Connections			
G3: RJ45	Name	RLC: RJ11	Name
5	TxEN	2	TxEN
6	COM	3	COM
1	TxB	5	B-
2	TxA	4	A+

G3 to Modular Controller (CBLRLC05)

Connections			
G3	Name	Modular Controller	Name
1,4	TxB	1,4	TxB
4,1	RxB	4,1	RxB
2,3	TxA	2,3	TxA
3,2	RxA	3,2	RxA
5	TxEN	5	TxEN
6	COM	6	COM
7	TxB	7	TxB
8	TxA	8	TxA

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SOFTWARE/UNIT OPERATION

CRIMSON SOFTWARE

Crimson software is available as a free download from Red Lion's website or it can be purchased on a CD, see "Ordering Information" for part number. The latest version of the software is always available from the website, and updating your copy is free.

DISPLAY

This operator interface uses a liquid crystal display (LCD) for displaying text and graphics. The display utilizes a cold cathode fluorescent tube (CCFL) for lighting the display. The CCFL tubes can be dimmed for low light conditions.

These CCFL tubes have a limited lifetime. Backlight lifetime is based upon the amount of time the display is turned on at full intensity. Turning the backlight off when the display is not in use can extend the lifetime of your backlight. This can be accomplished through the Crimson software when configuring your unit.

FRONT PANEL LEDS

There are three front panel LEDs. Shown below is the default status of the LEDs.

LED	INDICATION
RED (TOP, LABELED "PWR")	
FLASHING	Unit is in the boot loader, no valid configuration is loaded.[1]
STEADY	Unit is powered and running an application.
YELLOW (MIDDLE)	
OFF	No CompactFlash card is present.
STEADY	Valid CompactFlash card present.
FLASHING RAPIDLY	CompactFlash card being checked.
FLICKERING	Unit is writing to the CompactFlash, either because it is storing data, or because the PC connected via the USB port has locked the drive.[2]
FLASHING SLOWLY	Incorrectly formatted CompactFlash card present.
GREEN (BOTTOM)	
FLASHING	A tag is in an alarm state.
STEADY	Valid configuration is loaded and there are no alarms present.

1. The operator interface is shipped without a configuration. After downloading a configuration, if the light remains in the flashing state continuously, try cycling power. If the LED still continues to flash, try downloading a configuration again.
2. Do not turn off power to the unit while this light is flickering. The unit writes data in two minute intervals. Later Microsoft operating systems will not lock the drive unless they need to write data; Windows 98 may lock the drive any time it is mounted, thereby interfering with logging. Refer to "Mounting the CompactFlash" in the Crimson 2 User Manual.

TOUCHSCREEN

This operator interface utilizes a resistive analog touchscreen for user input. The unit will only produce an audible tone (beep) when a touch on an active touchscreen cell is sensed. The touchscreen is fully functional as soon as the operator interface is initialized, and can be operated with gloved hands.

KEYPAD

The G308 keypad consists of seven keys that can be used for on-screen menus.

TROUBLESHOOTING YOUR G308

If for any reason you have trouble operating, connecting, or simply have questions concerning your new G308, contact Red Lion's technical support. For contact information, refer to the back page of this bulletin for phone and fax numbers.

EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net

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BATTERY & TIME KEEPING

WARNING - EXPLOSION HAZARD - THE AREA MUST BE KNOWN TO BE NON-HAZARDOUS BEFORE SERVICING/ REPLACING THE UNIT AND BEFORE INSTALLING OR REMOVING I/O WIRING AND BATTERY.

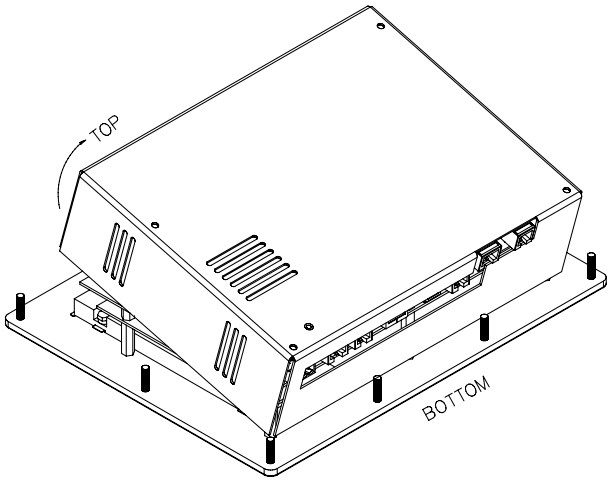
WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN DISCONNECTED AND THE AREA IS KNOWN TO BE NON-HAZARDOUS.

A battery is used to keep time when the unit is without power. Typical accuracy of the G308 time keeping is less than one minute per month drift. The battery of a G308 unit does not affect the unit's memory, all configurations and data is stored in non-volatile memory.

CAUTION: RISK OF ELECTRIC SHOCK
The inverter board, attached to the mounting plate, supplies the high voltage to operate the backlight. Touching the inverter board may result in injury to personnel.

CAUTION: The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

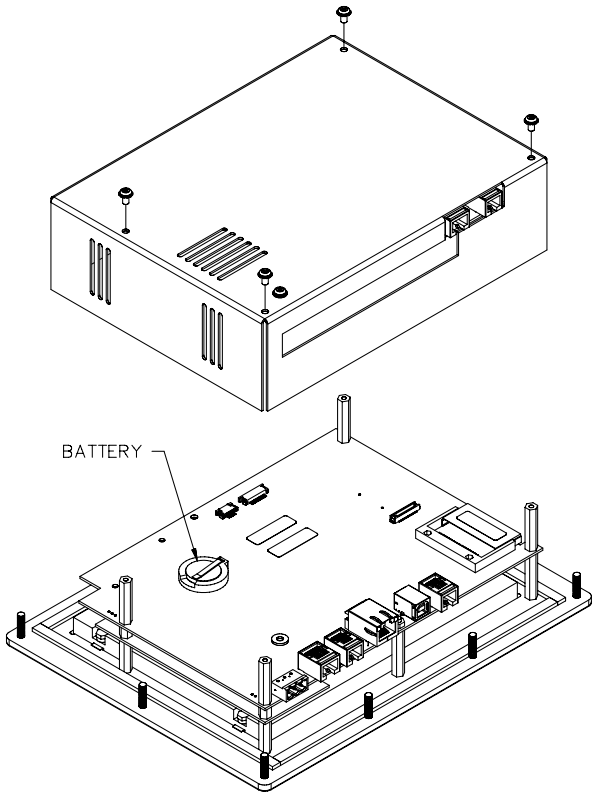
To change the battery of a G308, remove power, cabling, and then the rear cover of the unit. To remove the cover, remove the four screws designated by the arrows on the rear of the unit. Then, by lifting the top side, hinge the cover, thus providing clearance for the connectors on the bottom side of the PCB as shown in the illustration below. Install in the reverse manner.



Remove the old battery* from the holder and replace with the new battery. Replace the rear cover, cables, and re-apply power. Using Crimson or the unit's keypad, enter the correct time and date.

** Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. Also, the battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents come into contact with human skin.*

The battery used by the G308 is a lithium type CR2025.



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Optional Features and Accessories

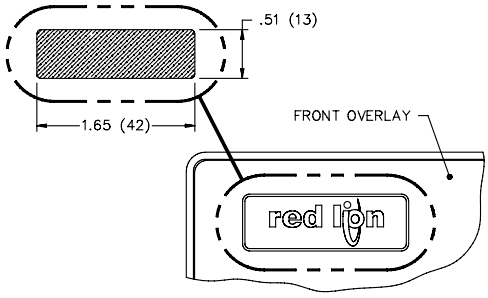
OPTIONAL COMMUNICATION CARD

Red Lion offers optional communication cards for fieldbus communications. These communication cards will allow your G308 to communicate with many of the popular fieldbus protocols.

Red Lion is also offering a communications card for additional RS232 and RS422/485 communications. Visit Red Lion's website for information and availability of these cards.

CUSTOM LOGO

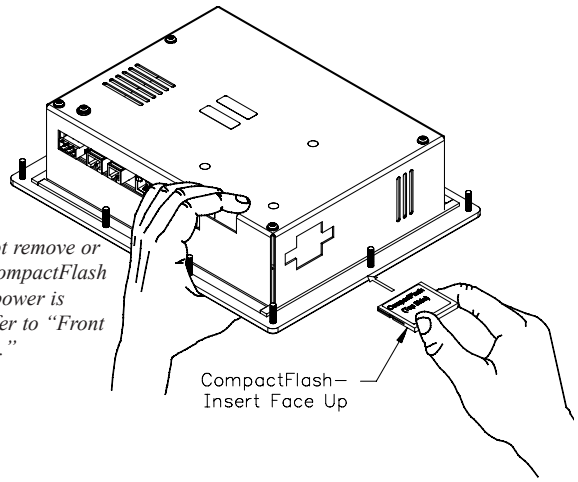
Each G3 operator interface has an embossed area containing the Red Lion logo. Red Lion can provide custom logos to apply to this area. Contact your distributor for additional information and pricing.



COMPACTFLASH SOCKET

CompactFlash socket is a Type II socket that can accept either Type I or II cards. Use cards with a minimum of 4 Mbytes and a maximum of 2 Gbytes with the G308's CompactFlash socket. Cards are available at most computer and office supply retailers.

CompactFlash can be used for configuration transfers, larger configurations, data logging, and trending.



Note: Do not remove or insert the CompactFlash card while power is applied. Refer to "Front Panel LEDs."

Information stored on a CompactFlash card by a G308 can be read by a card reader attached to a PC. This information is stored in IBM (Windows®) PC compatible FAT16 file format.

NOTE

For reliable operation in all of our products, Red Lion recommends the use of SanDisk® and SimpleTech brands of CompactFlash cards.

Industrial grade versions that provide up to two million write/erase cycles minimum are available from Red Lion.

LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

No warranties expressed or implied are created with respect to The Company's products except those expressly contained herein. The Customer acknowledges the disclaimers and limitations contained herein and relies on no other warranties or affirmations.

Red Lion Controls
20 Willow Springs Circle
York PA 17406
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839

Red Lion Controls BV
Printerweg 10
NL - 3821 AD Amersfoort
Tel +31 (0) 334 723 225
Fax +31 (0) 334 893 793

Red Lion Controls AP
Unit 101, XinAn Plaza
Building 13, No.99 Tianzhou Road
ShangHai, P.R. China 200223
Tel +86 21 6113-3688
Fax +86 21 6113-3683

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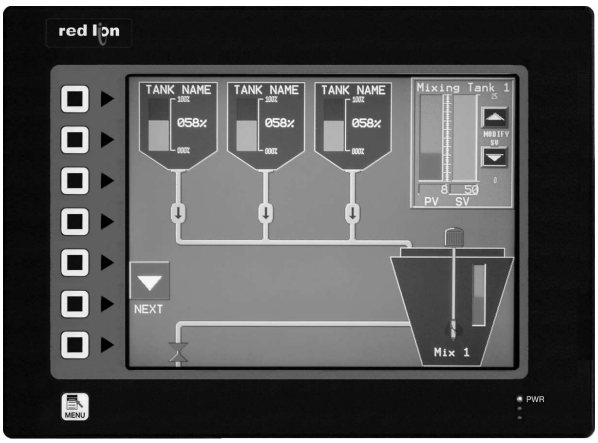
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839
www.redlion.net

Bulletin No. G310-J
Drawing No. LP0581
Released 1/08

MODEL G310 - GRAPHIC LCD OPERATOR INTERFACE TERMINAL WITH VGA DISPLAY AND TOUCHSCREEN



- ***Configured using Crimson software*** *(version 2.0 or later)*
- ***Up to 5 RS-232/422/485 communications ports*** *(2 RS-232 and 1 RS-422/485 on board, 1 RS-232 and 1 RS422/485 on optional communications card)*
- ***10 Base T/100 Base-TX Ethernet Port*** *to network units and host web pages*
- ***USB Port*** *to download the unit's configuration from a PC or for data transfers to a PC*
- ***Unit's configuration is stored in non-volatile memory*** *(8Mbyte Flash)*
- ***CompactFlash® Socket*** *to increase memory capacity*
- ***10.4-inch TFT 256 Color VGA 640x480 pixel LCD***
- ***Sunlight Visible Outdoor Unit with UV rated overlay available***
- ***8-button keypad*** *for on-screen menus*
- ***Three front panel LEDs***
- ***Power unit from 24VDC ±20% supply***
- ***Resistive Analog Touchscreen***

c UL us LISTED 63YN
LABORATORY EQUIPMENT

FOR USE IN HAZARDOUS LOCATIONS:
Class I, Division 2, Groups A, B, C, and D
Class II, Division 2, Groups F and G
Class III, Division 2

CE

GENERAL DESCRIPTION

The G310 Operator Interface Terminal combines unique capabilities normally expected from high-end units with a very affordable price. It is built around a high performance core with integrated functionality. This core allows the G310 to perform many of the normal features of the Paradigm range of Operator Interfaces while improving and adding new features.

The G310 is able to communicate with many different types of hardware using high-speed RS232/422/485 communications ports and Ethernet 10 Base T/100 Base-TX communications. In addition, the G310 features USB for fast downloads of configuration files and access to trending and data logging. A CompactFlash socket is provided so that Flash cards can be used to collect your trending and data logging information as well as to store larger configuration files.

In addition to accessing and controlling of external resources, the G310 allows a user to easily view and enter information. A sunlight visible outdoor version is available for direct sunlight applications. Users can enter data through the touchscreen or front panel 8-button keypad.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller.

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2/CLASS II, DIVISION 2/CLASS III, DIVISION 2

CAUTION: Risk Of Danger.
Read complete instructions prior to installation and operation of the unit.

CAUTION: Risk of electric shock.

CompactFlash is a registered trademark of CompactFlash Association.

CONTENTS OF PACKAGE

- G310 Operator Interface.
- Panel Gasket.
- This hardware bulletin.
- Template for panel cutout.
- Hardware packet for mounting unit into panel.
- Terminal block for connecting power.

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
G310	Operator Interface for indoor applications only, textured finish with embossed keys	G310C000
	Operator Interface for indoor or outdoor applications, glossy finish with UV rated overlay (keys are not embossed)	G310S000
G3CF	64 MB CompactFlash Card [5]	G3CF064M
	256 MB CompactFlash Card [5]	G3CF256M
	512 MB CompactFlash Card [5]	G3CF512M
G3RS	RS 232/485 Optional Communication Card	G3RS0000
G3CN	CANopen Optional Communication Card	G3CN0000
G3PBDP	Profibus DP Optional Communication Card	G3PBDP00
SFCRM2	Crimson [2]	SFCRM200
CBL	RS-232 Programming Cable	CBLPROG0
	USB Cable	CBLUSB00
	Communications Cables [1]	CBLxxxxx
DR	DIN Rail Mountable Adapter Products [3]	DRxxxxxx
	Replacement Battery [4]	BNL20000
	G310C Backlight Replacement [6]	G3BR10C0
	G310S Backlight Replacement [6]	G3BR10S0
G3FILM	Protective Films	G3FILM10

[1] Contact your Red Lion distributor or visit our website for complete selection.
[2] Use this part number to purchase Crimson on CD with a printed manual, USB cable, and RS-232 cable. Otherwise, download for free from www.redlion.net.
[3] Red Lion offers RJ modular jack adapters. Refer to the DR literature for complete details.
[4] Battery type is lithium coin type CR2025
[5] Industrial grade two million write cycles.
[6] For use in non-hazardous locations only.

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SPECIFICATIONS

1. **POWER REQUIREMENTS**:
   G310C: +24 VDC ±20% @ 33 W maximum.
   G310S: +24 VDC ±20% @ 50 W maximum.
   Must use Class 2 or SELV rated power supply.
   Power connection via removable three position terminal block.
   Notes:
   1. The front panel PWR LED indicates power.
   2. The G310's circuit common is not connected to the enclosure of the unit. See "Connecting to Earth Ground" in the section "Installing and Powering the G310."
2. **BATTERY**: Lithium coin cell. Typical lifetime of 10 years.
3. **LCD MODULE DISPLAYS**:

MODEL	G310C	G310S
SIZE	10.4-inch	10.4-inch
TYPE	TFT	TFT
COLORS	256 VGA	256 VGA
PIXELS	640 X 480	640 X 480
BRIGHTNESS	450 cd/m^2	850 cd/m^2
BACKLIGHT*	50,000 HR TYP.	20,000 HR TYP.

*Lifetime at room temperature. Refer to "Display" in the "Software/Unit Operation" section.

4. **8-KEY KEYPAD**: for on-screen menus.
5. **TOUCHSCREEN**: Resistive analog
6. **MEMORY**:
   On Board User Memory: 8 Mbyte of onboard non-volatile Flash memory.
   Memory Card: CompactFlash Type II slot for Type I and Type II CompactFlash cards.
7. **COMMUNICATIONS**:
   USB Port: Adheres to USB specification 1.1. Device only using Type B connection.

> ⚠ WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

   Serial Ports: Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
   PGM Port: RS232 port via RJ12.
   COMMS Ports: RS422/485 port via RJ45, and RS232 port via RJ12.
   DH485 TXEN: Transmit enable; open collector, V_{OH} = 15 VDC, V_{OL} = 0.5 V @ 25 mA max.
   Note: For additional information on the communications or signal common and connections to earth ground please see the "Connecting to Earth Ground" in the section "Installing and Powering the G310."
   Ethernet Port: 10 BASE-T / 100 BASE-TX
   RJ45 jack is wired as a NIC (Network Interface Card).
8. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: 0 to 50°C
   Storage Temperature Range: G310C: -20 to 70°C
   G310S: -20 to 60°C
   Operating and Storage Humidity: 80% maximum relative humidity (non-condensing) from 0 to 50°C.
   Vibration According to IEC 68-2-6: 10 to 55 Hz, in X, Y, Z direction for 1.5 hours, 1 g.
   Shock According to IEC 68-2-27: Operational 30 g, 9 msec in 3 directions.
   Altitude: Up to 2000 meters.
9. **CERTIFICATIONS AND COMPLIANCES**:
   SAFETY
   UL Recognized Component, File #E179259, UL61010-1, CSA 22.2 No.61010-1
   Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.
   UL Listed, File #E211967, UL61010-1, UL1604, CSA 22.2 No. 61010.1, CSA 22.2 No. 213-M1987
   LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
   Type 4X Enclosure rating (Face only), UL50
   IECEE CB Scheme Test Certificate #US/9737C/UL,
   CB Scheme Test Report #E179259-V01-S04
   Issued by Underwriters Laboratories Inc.
   IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
   IP66 Enclosure rating (Face only), IEC 529
   ELECTROMAGNETIC COMPATIBILITY
   Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.

Immunity to Industrial Locations:

Electrostatic discharge	EN 61000-4-2	Criterion A 4 kV contact discharge 8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Criterion A 10 V/m
Fast transients (burst)	EN 61000-4-4	Criterion A 2 kV power 2 kV signal
Surge	EN 61000-4-5	Criterion A 1 kV L-L, 2 kV L&N-E power
RF conducted interference	EN 61000-4-6	Criterion B 3 V/rms

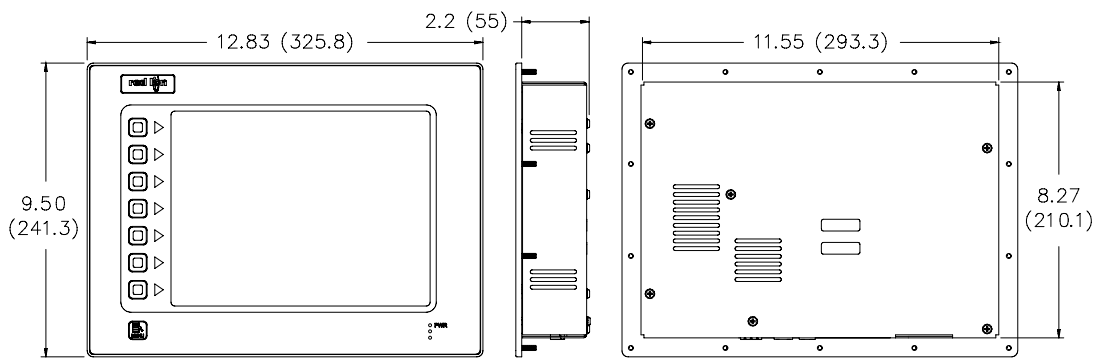
Emissions:

Emissions	EN 55011	Class A

Notes:
1. Criterion A: Normal operation within specified limits.
2. Criterion B: Temporary loss of performance from which the unit self-recovers.

10. **CONNECTIONS**: Compression cage-clamp terminal block.
    Wire Gage: 12-30 AWG copper wire
    Torque: 5-7 inch-pounds (56-79 N-cm)
11. **CONSTRUCTION**: Steel rear metal enclosure with NEMA 4X/IP66 aluminum front plate when correctly fitted with the gasket provided. Installation Category II, Pollution Degree 2.
12. **MOUNTING REQUIREMENTS**: Maximum panel thickness is 0.25" (6.3 mm). For NEMA 4X/IP66 sealing, a steel panel with a minimum thickness of 0.125" (3.17 mm) is recommended.
    Maximum Mounting Stud Torque: 17 inch-pounds (1.92 N-m)
13. **WEIGHT**: 5.53 lbs (2.51 Kg)

DIMENSIONS In inches (mm)



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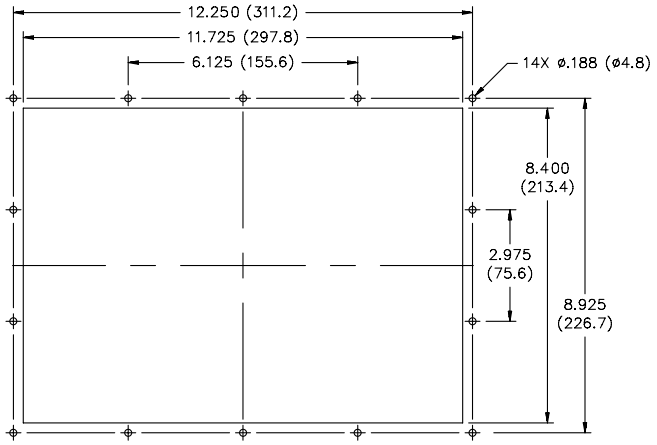
INSTALLING AND POWERING THE G310

MOUNTING INSTRUCTIONS

This operator interface is designed for through-panel mounting. A panel cut-out diagram and a template are provided. Care should be taken to remove any loose material from the mounting cut-out to prevent that material from falling into the operator interface during installation. A gasket is provided to enable sealing to NEMA 4X/IP66 specification. Install the 14 kep nuts provided and tighten evenly for uniform gasket compression.

Note: Tightening the kep nuts beyond a maximum of 17 inch-pounds (1.92 N-m) may cause damage to the front panel.



All tolerances ±0.010" (±0.25 mm).

ALL NONINCENDIVE CIRCUITS MUST BE WIRED USING DIVISION 2 WIRING METHODS AS SPECIFIED IN ARTICLE 501-4 (b), 502-4 (b), AND 503-3 (b) OF THE NATIONAL ELECTRICAL CODE, NFPA 70 FOR INSTALLATION WITHIN THE UNITED STATES, OR AS SPECIFIED IN SECTION 19-152 OF CANADIAN ELECTRICAL CODE FOR INSTALLATION IN CANADA.

CONNECTING TO EARTH GROUND

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

Each G310 has a chassis ground terminal on the back of the unit. Your unit should be connected to earth ground (protective earth).

The chassis ground is not connected to signal common of the unit. Maintaining isolation between earth ground and signal common is not required to operate your unit. But, other equipment connected to this unit may require isolation between signal common and earth ground. *To maintain isolation between signal common and earth ground care must be taken when connections are made to the unit.* For example, a power supply with isolation between its signal common and earth ground must be used. Also, plugging in a USB cable may connect signal common and earth ground.[1]

1. USB's shield may be connected to earth ground at the host. USB's shield in turn may also be connected to signal common.

POWER SUPPLY REQUIREMENTS

The G310C requires a 24 VDC power supply rated at 33 W, and the G310S requires a 24 VDC power supply rated at 50 W. Your unit may draw considerably less the rated power depending upon the options being used. As additional features are used your unit will draw increasing amounts of power. Items that could cause increases in current are additional communications, optional communications card, CompactFlash card, and other features programmed through Crimson.

In any case, it is very important that the power supply is mounted correctly if the unit is to operate reliably. Please take care to observe the following points:

- The power supply must be mounted close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the operator interface. Ideally, the shortest length possible should be used.
- The wire used to connect the operator interface's power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
- A power supply with a Class 2 or SELV rating is to be used. A Class 2 or SELV power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for "safety extra-low voltage." Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.

COMMUNICATING WITH THE G310

CONFIGURING A G310

The G310 is configured using Crimson software. Crimson is available as a free download from Red Lion's website, or it can be purchased on CD. Updates to Crimson for new features and drivers are posted on the website as they become available. By configuring the G310 using the latest version of Crimson, you are assured that your unit has the most up to date feature set. Crimson software can configure the G310 through the RS232 PGM port, USB port, or CompactFlash.

The USB port is connected using a standard USB cable with a Type B connector. The driver needed to use the USB port will be installed with Crimson. If this driver has not been installed, it can be downloaded from the website.

The RS232 PGM port uses a programming cable made by Red Lion to connect to the DB9 COM port of your computer. If you choose to make your own cable, use the "G310 Port Pin Out Diagram" for wiring information.

The CompactFlash can be used to program a G3 by placing a configuration file and firmware on the CompactFlash card. The card is then inserted into the target G3 and powered. Refer to the Crimson literature for more information on the proper names and locations of the files.

CABLES AND DRIVERS

Red Lion has a wide range of cables and drivers for use with many different communication types. A list of these drivers and cables along with pin outs is available from Red Lion's website. New cables and drivers are added on a regular basis. If making your own cable, refer to the "G310 Port Pin Outs" for wiring information.

USB, DATA TRANSFERS FROM THE COMPACTFLASH CARD

WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

In order to transfer data from the CompactFlash card via the USB port, a driver must be installed on your computer. This driver is installed with Crimson and is located in the folder C:\Program Files\Red Lion Controls\Crimson 2.0\Device\ after Crimson is installed. This may have already been accomplished if your G310 was configured using the USB port.

Once the driver is installed, connect the G310 to your PC with a USB cable, and follow "Mounting the CompactFlash" instructions in the Crimson 2 user manual.

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ETHERNET COMMUNICATIONS

Ethernet communications can be established at either 10 BASE-T or 100 BASE-TX. The G310 unit's RJ45 jack is wired as a NIC (Network Interface Card). For example, when wiring to a hub or switch use a straight-through cable, but when connecting to another NIC use a crossover cable.

The Ethernet connector contains two LEDs. A yellow LED in the upper right, and a bi-color green/amber LED in the upper left. The LEDs represent the following statuses.

LED COLOR	DESCRIPTION
YELLOW solid	Link established.
YELLOW flashing	Data being transferred.
GREEN	10 BASE-T Communications
AMBER	100 BASE-TX Communications

The Crimson manual contains additional information on Ethernet communications.

RS232 PORTS

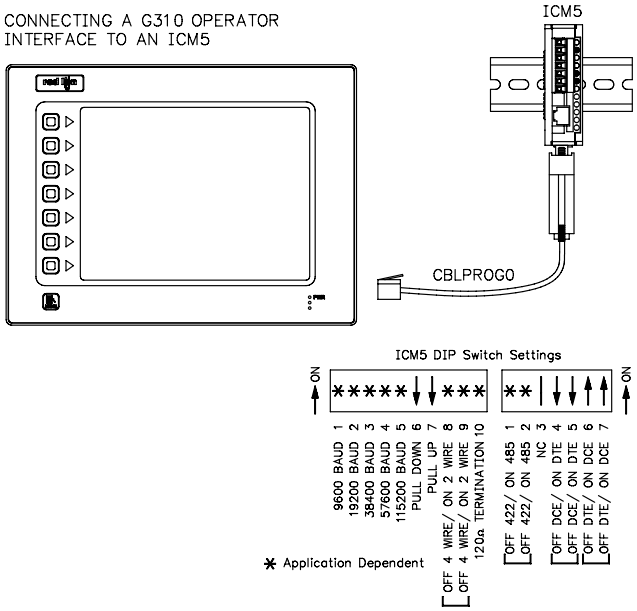
The G310 has two RS232 ports. There is the PGM port and the COMMS port. Although only one of these ports can be used for programming, both ports can be used for communications with a PLC.

The RS232 PGM port can be used for either master or slave protocols with any G310 configuration.

Examples of RS232 communications could involve another Red Lion product or a PC. By using a cable with RJ12 ends on it, and a twist in the cable, RS232 communications with another G3 product or the Modular Controller can be established. Red Lion part numbers for cables with a twist in them are CBLPROG0 [1], CBLRLC01 [2], or CBLRC02 [3].

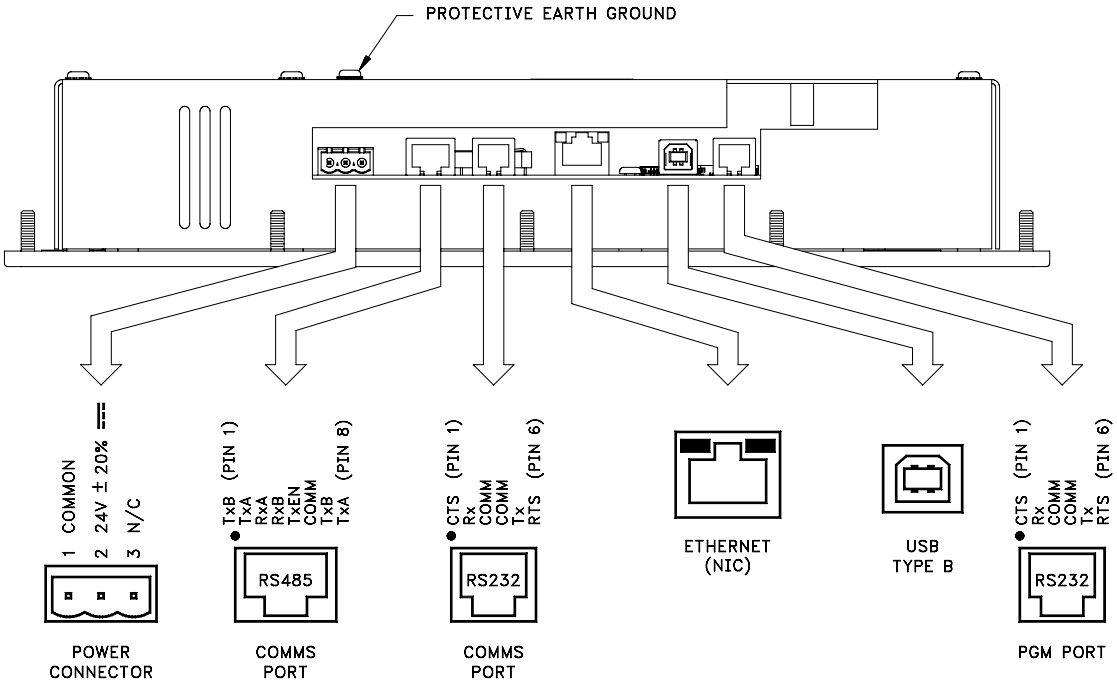
G3 RS232 to a PC

Connections			
G3: RJ12	Name	PC: DB9	Name
4	COMM	1	DCD
5	Tx	2	Rx
2	Rx	3	Tx
	N/C	4	DTR
3	COM	5	GND
	N/C	6	DSR
1	CTS	7	RTS
6	RTS	8	CTS
	N/C	9	RI



[1] CBLPROG0 can also be used to communicate with either a PC or an ICM5.
[2] DB9 adapter not included, 1 foot long.
[3] DB9 adapter not included, 10 feet long.

G310 PORT PIN OUTS



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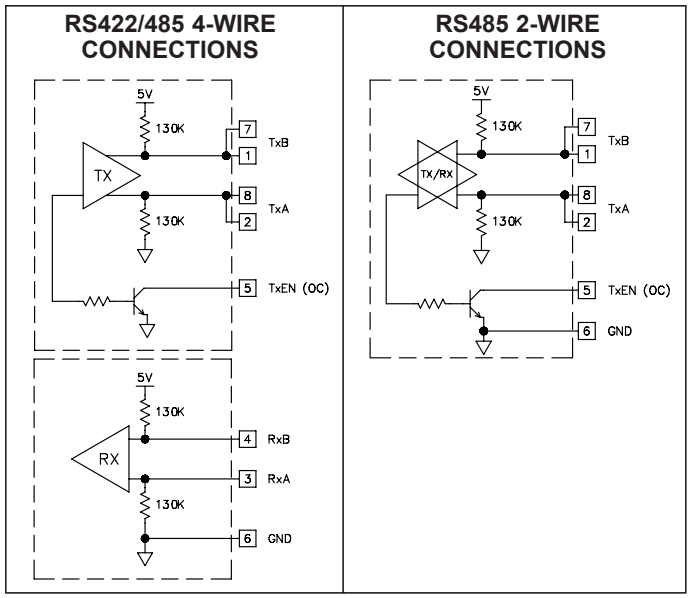
RS422/485 COMMS PORT

The G310 has one RS422/485 port. This port can be configured to act as either RS422 or RS485.



***Note**: All Red Lion devices connect A to A and B to B, except for Paradigm devices. Refer to www.redlion.net for additional information.*

DH485 COMMUNICATIONS

The G310's RS422/485 COMMS port can also be used for Allen Bradley DH485 communications.

WARNING: **DO NOT** use a standard DH485 cable to connect this port to Allen Bradley equipment. A cable and wiring diagram are available from Red Lion.

G3 to AB SLC 500 (CBLAB003)

Connections			
RJ45: RLC	Name	RJ45: A-B	Name
1	TxB	1	A
2	TxA	2	B
3, 8	RxA	-	24V
4, 7	RxB	-	COMM
5	TxEN	5	TxEN
6	COMM	4	SHIELD
4, 7	TxB	-	COMM
3, 8	TxA	-	24V

Examples of RS485 2-Wire Connections

G3 to Red Lion RJ11 (CBLRLC00) DLC, IAMS, ITMS, PAXCDC4C

Connections			
G3: RJ45	Name	RLC: RJ11	Name
5	TxEN	2	TxEN
6	COM	3	COM
1	TxB	5	B-
2	TxA	4	A+

G3 to Modular Controller (CBLRLC05)

Connections			
G3	Name	Modular Controller	Name
1,4	TxB	1,4	TxB
4,1	RxB	4,1	RxB
2,3	TxA	2,3	TxA
3,2	RxA	3,2	RxA
5	TxEN	5	TxEN
6	COM	6	COM
7	TxB	7	TxB
8	TxA	8	TxA

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SOFTWARE/UNIT OPERATION

CRIMSON SOFTWARE

Crimson software is available as a free download from Red Lion's website or it can be purchased on a CD, see "Ordering Information" for part number. The latest version of the software is always available from the website, and updating your copy is free.

DISPLAY

This operator interface uses a liquid crystal display (LCD) for displaying text and graphics. The display utilizes a cold cathode fluorescent tube (CCFL) for lighting the display. The CCFL tubes can be dimmed for low light conditions.

These CCFL tubes have a limited lifetime. Backlight lifetime is based upon the amount of time the display is turned on at full intensity. Turning the backlight off when the display is not in use can extend the lifetime of your backlight. This can be accomplished through the Crimson software when configuring your unit.

BACKLIGHT REPLACEMENT

CAUTION:

Backlight is not field replaceable for hazardous location applications. Unit must be returned to Red Lion Controls for repair.

The backlight assembly is field replaceable in non-hazardous locations only. Refer to the instructions included in the appropriate backlight replacement kit.

FRONT PANEL LEDS

There are three front panel LEDs. Shown below is the default status of the LEDs.

LED	INDICATION
RED (TOP, LABELED "PWR")	
FLASHING	Unit is in the boot loader, no valid configuration is loaded.[1]
STEADY	Unit is powered and running an application.
YELLOW (MIDDLE)	
OFF	No CompactFlash card is present.
STEADY	Valid CompactFlash card present.
FLASHING RAPIDLY	CompactFlash card being checked.
FLICKERING	Unit is writing to the CompactFlash, either because it is storing data, or because the PC connected via the USB port has locked the drive.[2]
FLASHING SLOWLY	Incorrectly formatted CompactFlash card present.
GREEN (BOTTOM)	
FLASHING	A tag is in an alarm state.
STEADY	Valid configuration is loaded and there are no alarms present.

1. The operator interface is shipped without a configuration. After downloading a configuration, if the light remains in the flashing state continuously, try cycling power. If the LED still continues to flash, try downloading a configuration again.
2. Do not turn off power to the unit while this light is flickering. The unit writes data in two minute intervals. Later Microsoft operating systems will not lock the drive unless they need to write data; Windows 98 may lock the drive any time it is mounted, thereby interfering with logging. Refer to "Mounting the CompactFlash" in the Crimson 2 User Manual.

KEYPAD

The G310 keypad consists of eight keys for on-screen menus.

TOUCHSCREEN

This operator interface utilizes a resistive analog touchscreen for user input. The unit will only produce an audible tone (beep) when a touch on an active touchscreen cell in sensed. The touchscreen is fully functional as soon as the operator interface is initialized, and can be operated with gloved hands.

TROUBLESHOOTING YOUR G310

If for any reason you have trouble operating, connecting, or simply have questions concerning your new G310, contact Red Lion's technical support. For contact information, refer to the back page of this bulletin for phone and fax numbers.

EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net

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BATTERY & TIME KEEPING

WARNING - EXPLOSION HAZARD - THE AREA MUST BE KNOWN TO BE NON-HAZARDOUS BEFORE SERVICING/ REPLACING THE UNIT AND BEFORE INSTALLING OR REMOVING I/O WIRING AND BATTERY.

WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN DISCONNECTED AND THE AREA IS KNOWN TO BE NON-HAZARDOUS.

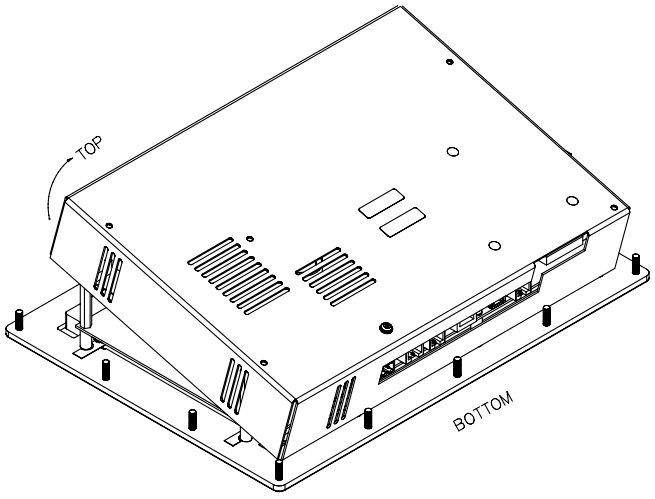
A battery is used to keep time when the unit is without power. Typical accuracy of the G310 time keeping is less than one minute per month drift. The battery of a G310 unit does not affect the unit's memory, all configurations and data is stored in non-volatile memory.

CAUTION: RISK OF ELECTRIC SHOCK
The inverter board, attached to the mounting plate, supplies the high voltage to operate the backlight. Touching the inverter board may result in injury to personnel.

CAUTION: The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

To change the battery of a G310, remove power, cabling, and then the rear cover of the unit. To remove the cover, remove the five screws designated by the arrows on the rear of the unit. Then, by lifting the top side, hinge the cover, thus providing clearance for the connectors on the bottom side of the PCB as shown in the illustration below. Install in the reverse manner.

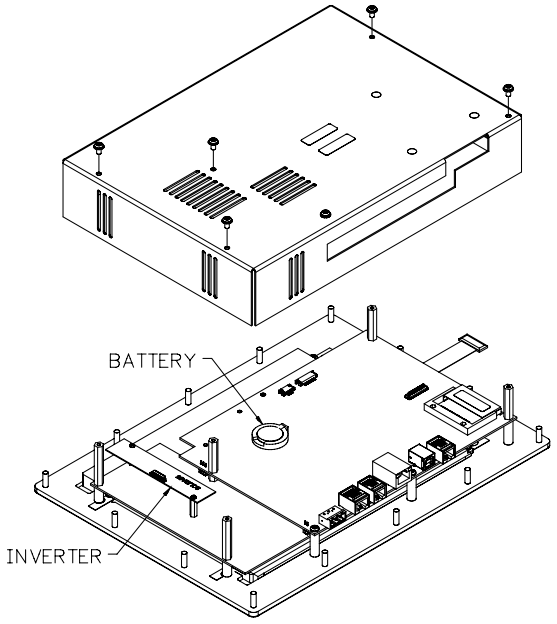
Remove the old battery* from the holder and replace with the new battery. Replace the rear cover, cables, and re-apply power. Using Crimson or the unit's keypad, enter the correct time and date.



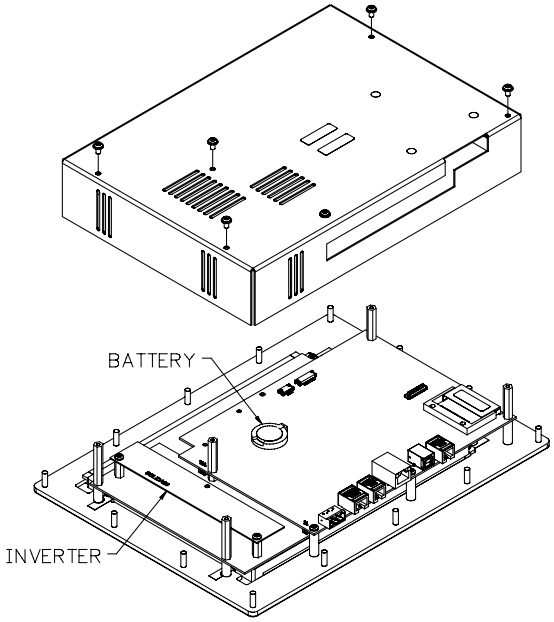
** Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. Also, the battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents come into contact with human skin.*

The battery used by the G310 is a lithium type CR2025.

G310C



G310S



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OPTIONAL FEATURES AND ACCESSORIES

INDOOR VERSUS OUTDOOR

Red Lion offers two versions of its G310 unit. The G310C000 uses an overlay with a textured finish and keys that are embossed. This overlay is not rated for outdoor use. The G310S000 uses an overlay with a glossy finish that uses UV rated material for outdoor use. The keys on this overlay are not embossed. The display is significantly brighter than the G310C000.

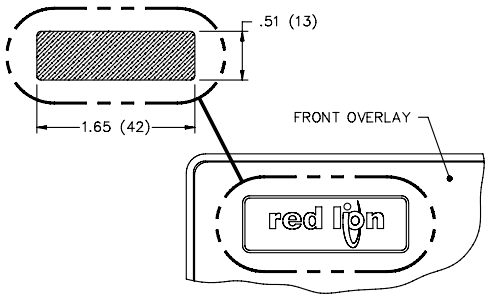
OPTIONAL COMMUNICATION CARD

Red Lion offers optional communication cards for fieldbus communications. These communication cards will allow your G310 to communicate with many of the popular fieldbus protocols.

Red Lion is also offering a communications card for additional RS232 and RS422/485 communications. Visit Red Lion's website for information and availability of these cards.

CUSTOM LOGO

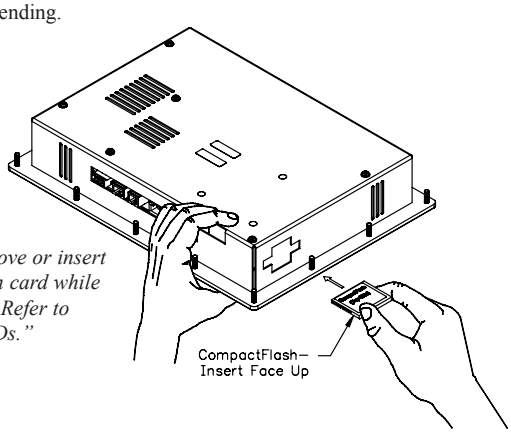
Each G3 operator interface has an embossed area containing the Red Lion logo. Red Lion can provide custom logos to apply to this area. Contact your distributor for additional information and pricing.



COMPACTFLASH SOCKET

CompactFlash socket is a Type II socket that can accept either Type I or II cards. Use cards with a minimum of 4 Mbytes and a maximum of 2 Gbytes with the G310's CompactFlash socket. Cards are available at most computer and office supply retailers.

CompactFlash can be used for configuration transfers, larger configurations, data logging, and trending.



Note: Do not remove or insert the CompactFlash card while power is applied. Refer to "Front Panel LEDs."

Information stored on a CompactFlash card by a G310 can be read by a card reader attached to a PC. This information is stored in IBM (Windows®) PC compatible FAT16 file format.

NOTE

For reliable operation in all of our products, Red Lion recommends the use of SanDisk® and SimpleTech brands of CompactFlash cards.

Industrial grade versions that provide up to two million write/erase cycles minimum are available from Red Lion.

LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

No warranties expressed or implied are created with respect to The Company's products except those expressly contained herein. The Customer acknowledges the disclaimers and limitations contained herein and relies on no other warranties or affirmations.

Red Lion Controls
20 Willow Springs Circle
York PA 17406
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839

Red Lion Controls BV
Printerweg 10
NL - 3821 AD Amersfoort
Tel +31 (0) 334 723 225
Fax +31 (0) 334 893 793

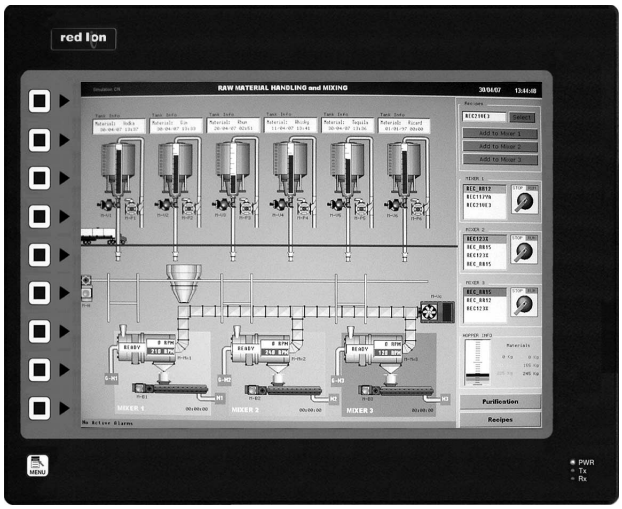
Red Lion Controls AP
Unit 101, XinAn Plaza
Building 13, No.99 Tianzhou Road
ShangHai, P.R. China 200223
Tel +86 21 6113-3688
Fax +86 21 6113-3683

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com

Tel +1 (717) 767-6511
Fax +1 (717) 764-0839
www.redlion.net

Bulletin No. G315C-A
Drawing No. LP0708
Released 8/07

MODEL G315C - GRAPHIC COLOR LCD OPERATOR INTERFACE TERMINAL WITH TFT XGA DISPLAY AND TOUCHSCREEN



- *CONFIGURED USING CRIMSON SOFTWARE (VERSION 2.0 OR LATER)*
- *UP TO 6 RS-232/422/485 COMMUNICATIONS PORTS (2 RS-232 AND 2 RS-422/485 ON BOARD, 1 RS-232 AND 1 RS422/485 ON OPTIONAL COMMUNICATIONS CARD)*
- *10 BASE T/100 BASE-TX ETHERNET PORT SUPPORTS MULTIPLE PROTOCOLS SIMULTANEOUSLY*
- *BUILT-IN WEB SERVER AND FTP SERVER/CLIENT*
- *USB PORT TO DOWNLOAD THE UNIT'S CONFIGURATION FROM A PC OR FOR DATA TRANSFERS TO A PC*
- *UNIT'S CONFIGURATION IS STORED IN NON-VOLATILE MEMORY (32 MBYTE FLASH)*
- *COMPACTFLASH® SOCKET FOR DATABASE/RECIPE STORAGE AND DATA LOGGING*
- *15-INCH TFT ACTIVE MATRIX 32K COLOR XGA 1024 X 768 PIXEL LCD*
- *10-BUTTON KEYPAD FOR ON-SCREEN MENUS*
- *THREE FRONT PANEL LED INDICATORS*
- *POWERED BY 24 VDC ±20% SUPPLY*
- *RESISTIVE ANALOG TOUCHSCREEN*

GENERAL DESCRIPTION

The G315C Operator Interface combines powerful features normally found only in PC-based HMIs, with the reliability of a dedicated operating system. It is built around a high performance core with integrated features, allowing it to provide SCADA-like functionality at a fraction of the cost.

The G315C is able to act as a multiple protocol converter using four high-speed RS232/422/485 communications ports and an Ethernet 10/100 Base-TX port. The Ethernet port supports up to four protocols simultaneously, allowing dissimilar Ethernet based products to communicate with one another.

The G315C's USB port allows fast downloads of configuration files and access to trending and data logging. A CompactFlash socket is provided so that standard ComplactFlash cards can be used to collect your trending and data logging information as well as to store configuration files. The built-in web server allows processes to be controlled remotely.

The G315C's large, high-resolution display allows users to easily view and enter information. Data can be manipulated through the touchscreen and/or the 10-button keypad.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller.

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

CAUTION: Risk Of Danger.
Read complete instructions prior to installation and operation of the unit.

CAUTION: Risk of electric shock.

CompactFlash is a registered trademark of CompactFlash Association.

CONTENTS OF PACKAGE

- G315C Operator Interface.
- Panel gasket.
- Template for panel cutout.
- Hardware packet for mounting unit into panel.
- Terminal block for connecting power.

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
G315C	Operator Interface for indoor applications, textured finish with embossed keys	G315C000
G3CF	64 MB CompactFlash Card [5]	G3CF064M
	256 MB CompactFlash Card [5]	G3CF256M
	512 MB CompactFlash Card [5]	G3CF512M
G3RS	RS232/485 Optional Communication Card	G3RS0000
G3CN	CANopen Optional Communication Card	G3CN0000
G3DN	DeviceNet option card for G3 operator interfaces with isolated high speed communications ports	G3DN0000
G3PBDP	Profibus DP Optional Communication Card	G3PBDP00
PSDR	DIN Rail Power Supply	PSDR0400
SFCRM2	Crimson 2.0 [2]	SFCRM200
CBL	RS-232 Programming Cable	CBLPROG0
	USB Cable	CBLUSB00
	Communications Cables [1]	CBLxxxxx
DR	DIN Rail Mountable Adapter Products [3]	DRxxxxxx
	Replacement Battery [4]	BNL20000

[1] Contact your Red Lion distributor or visit our website for complete selection.
[2] Use this part number to purchase Crimson on CD with a printed manual, USB cable, and RS-232 cable. Otherwise, download for free from www.redlion.net.
[3] Red Lion offers RJ modular jack adapters. Refer to the DR literature for complete details.
[4] Battery type is lithium coin type CR2025.
[5] Industrial grade two million write cycles.

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SPECIFICATIONS

1. **POWER REQUIREMENTS**:
   Must use Class 2 or SELV rated power supply.
   Power connection via removable three position terminal block.
   Supply Voltage: +24 VDC ±20%
   Typical Power[1]: 27 W
   Maximum Power[2]: 67 W
   Notes:
   1. Typical power with +24 VDC, RS232/485 communications, Ethernet communications, CompactFlash card installed, and display at full brightness.
   2. Maximum power indicates the most power that can be drawn from the G315C. Refer to "Power Supply Requirements" under "Installing and Powering the G315C."
   3. The G315C's circuit common is not connected to the enclosure of the unit. See "Connecting to Earth Ground" in the section "Installing and Powering the G315C."
   4. Read "Power Supply Requirements" in the section "Installing and Powering the G315C" for additional power supply information.
2. **BATTERY**: Lithium coin cell. Typical lifetime of 10 years.
3. **LCD DISPLAY**:

SIZE	15-inch
TYPE	TFT
COLORS	32K
PIXELS	1024 X 768
BRIGHTNESS	600 cd/m^2
BACKLIGHT*	50,000 HR TYP.

*Lifetime at room temperature. Refer to "Display" in "Software/Unit Operation"

4. **10-KEY KEYPAD**: for on-screen menus.
5. **TOUCHSCREEN**: Resistive analog
6. **MEMORY**:
   On Board User Memory: 32 Mbyte of non-volatile Flash memory.
   Memory Card: CompactFlash Type II slot for Type I and Type II CompactFlash cards.
7. **COMMUNICATIONS**:
   USB Device Port: Adheres to USB 2.0 Specification supporting high speed and full speed via Type B connection.

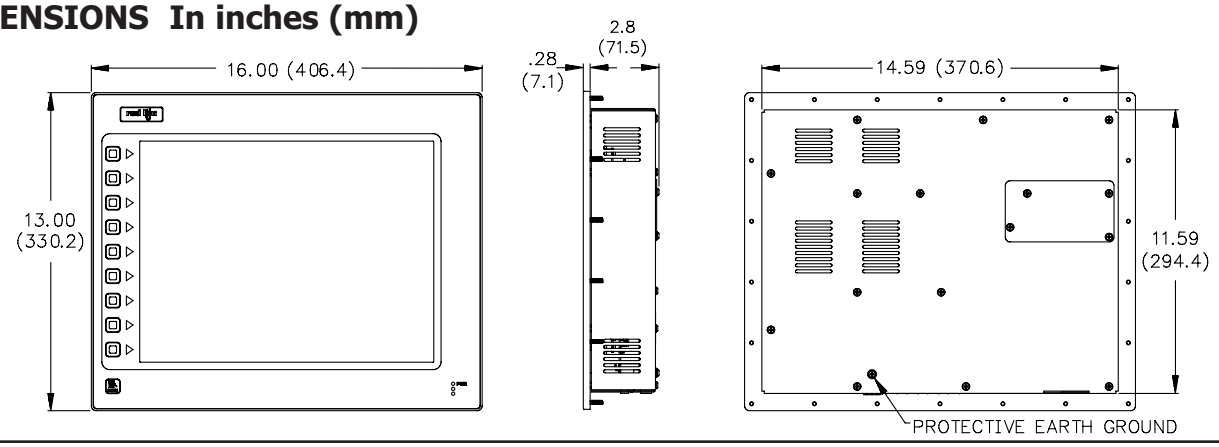
> ⚠ WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

   Serial Ports: Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
   PGM Port: RS232 port via RJ12.
   COMMS Ports: RS422/485 port via RJ45, and RS232 port via RJ12.
   DH485 TXEN: Transmit enable; open collector, V_{OH} = 15 VDC, V_{OL} = 0.5 V @ 25 mA max.
   Note: For additional information on the communications or signal common and connections to earth ground please see the "Connecting to Earth Ground" in the section "Installing and Powering the G315C."
   Port to port isolation: 500 Vrms for 1 minutes signal isolation : 50V
   Ethernet Port: 10 BASE-T / 100 BASE-TX
   RJ45 jack is wired as a NIC (Network Interface Card).
   Isolation from Ethernet network to G3 operator interface: 1500 Vrms
8. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: 0 to 50°C
   Storage Temperature Range: -20 to 70°C
   Operating and Storage Humidity: 80% maximum relative humidity (non-condensing) from 0 to 50°C.
   Altitude: Up to 2000 meters.
9. **CERTIFICATIONS AND COMPLIANCES**:
   SAFETY
   IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
   IP66 Enclosure rating (Face only), IEC 529
   Type 4X Enclosure rating (Face only), UL50
   ELECTROMAGNETIC COMPATIBILITY
   Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.

Immunity to Industrial Locations:		
Electrostatic discharge	EN 61000-4-2	Criterion A 4 kV contact discharge 8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Criterion B 10 V/m
Fast transients (burst)	EN 61000-4-4	Criterion B 2 kV power 1 kV signal
Surge	EN 61000-4-5	Criterion A 1 kV L-L, 2 kV L&N-E power
RF conducted interference	EN 61000-4-6	Criterion B 3 V/rms
Emissions:		
Emissions	EN 55011	Class A

   Note:
   1. Criterion A: Normal operation within specified limits.
   2. Criterion B: Temporary loss of performance from which the unit self recovers.
10. **CONNECTIONS**: Compression cage-clamp terminal block.
    Wire Gage: 12-22 AWG copper wire
    Torque: 5-7 inch-pounds (56-79 N-cm)
11. **CONSTRUCTION**: Steel rear metal enclosure with NEMA 4X/IP66 aluminum front plate for indoor use only when correctly fitted with the gasket provided. Installation Category II, Pollution Degree 2.
12. **MOUNTING REQUIREMENTS**: Maximum panel thickness is 0.25" (6.3 mm). For NEMA 4X/IP66 sealing, a steel panel with a minimum thickness of 0.125" (3.17 mm) is recommended.
    Maximum Mounting Stud Torque: 17 inch-pounds (1.92 N-m)
13. **WEIGHT**: 11.41 lbs (5.17 Kg)

DIMENSIONS In inches (mm)



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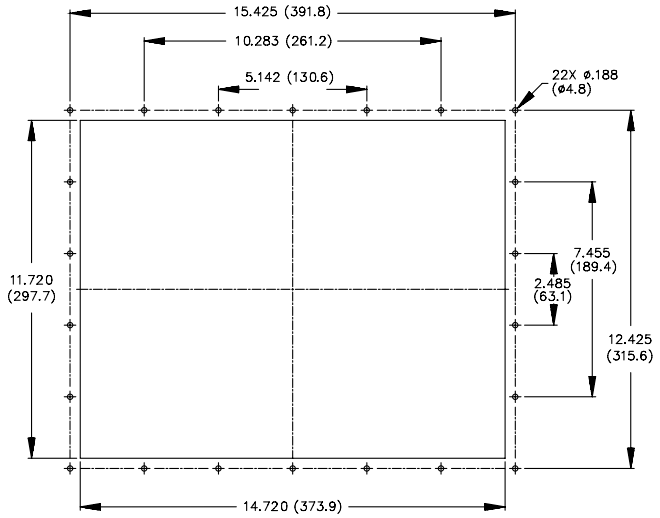
INSTALLING AND POWERING THE G315C

MOUNTING INSTRUCTIONS

This operator interface is designed for through-panel mounting. A panel cut-out diagram and a template are provided. Care should be taken to remove any loose material from the mounting cut-out to prevent that material from falling into the operator interface during installation. A gasket is provided to enable sealing to NEMA 4X/IP66 specification. Install the 22 kep nuts provided and tighten evenly for uniform gasket compression.

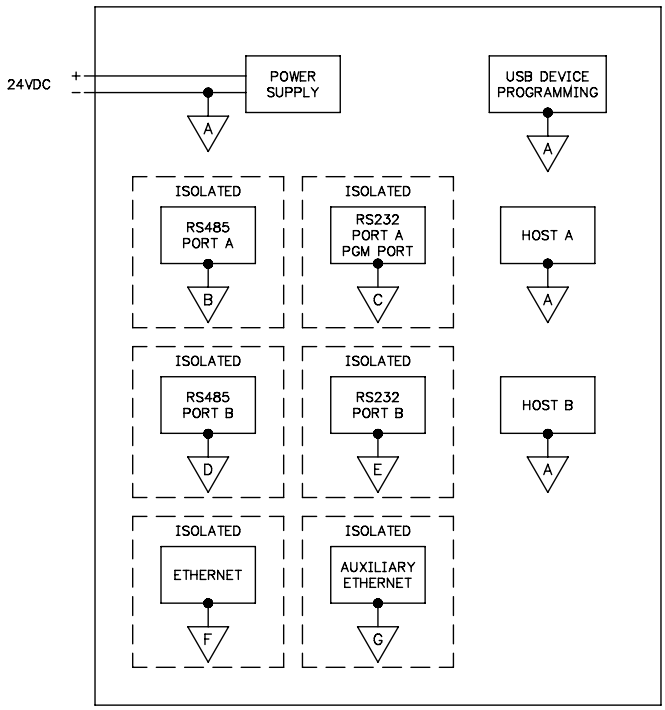
Note: Tightening the kep nuts beyond a maximum of 17 inch-pounds (1.92 N-m) may cause damage to the front panel.



All tolerances ±0.010" (±0.25 mm).

ALL NONINCENDIVE CIRCUITS MUST BE WIRED USING DIVISION 2 WIRING METHODS AS SPECIFIED IN ARTICLE 501-4 (b), 502-4 (b), AND 503-3 (b) OF THE NATIONAL ELECTRICAL CODE, NFPA 70 FOR INSTALLATION WITHIN THE UNITED STATES, OR AS SPECIFIED IN SECTION 19-152 OF CANADIAN ELECTRICAL CODE FOR INSTALLATION IN CANADA.

BLOCK DIAGRAM



CONNECTING TO EARTH GROUND

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

Each G315C has a chassis ground terminal on the back of the unit. Your unit should be connected to earth ground (protective earth).

The chassis ground is not connected to signal common of the unit. Maintaining isolation between earth ground and signal common is not required to operate your unit. But, other equipment connected to this unit may require isolation between signal common and earth ground. *To maintain isolation between signal common and earth ground care must be taken when connections are made to the unit.* For example, a power supply with isolation between its signal common and earth ground must be used. Also, plugging in a USB cable may connect signal common and earth ground.[1]

1. USB's shield may be connected to earth ground at the host. USB's shield in turn may also be connected to signal common.

POWER SUPPLY REQUIREMENTS

The G315C requires a 24 VDC power supply. Your unit may draw considerably less than the maximum rated power depending upon the options being used. As additional features are used your unit will draw increasing amounts of power. Items that could cause increases in current are additional communications, optional communications card, CompactFlash card, and other features programmed through Crimson.

In any case, it is very important that the power supply is mounted correctly if the unit is to operate reliably. Please take care to observe the following points:

- The power supply must be mounted close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the operator interface. Ideally, the shortest length possible should be used.
- The wire used to connect the operator interface's power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
- A power supply with a Class 2 or SELV rating is to be used. A Class 2 or SELV power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for "safety extra-low voltage." Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.

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COMMUNICATING WITH THE G315C

CONFIGURING A G315C

The G315C is configured using Crimson software. Crimson is available as a free download from Red Lion's website, or it can be purchased on CD. Updates to Crimson for new features and drivers are posted on the website as they become available. By configuring the G315C using the latest version of Crimson, you are assured that your unit has the most up to date feature set. Crimson software can configure the G315C through the RS232 PGM port, USB port, Ethernet port, or CompactFlash.

The USB port is connected using a standard USB cable with a Type B connector. The driver needed to use the USB port will be installed with Crimson.

The RS232 PGM port uses a programming cable made by Red Lion to connect to the DB9 COM port of your computer. If you choose to make your own cable, use the "G315C Port Pin Out Diagram" for wiring information.

The CompactFlash can be used to program a G3 by placing a configuration file and firmware on the CompactFlash card. The card is then inserted into the target G3, and the G3 is then powered up. Refer to the Crimson literature for more information on the proper names and locations of the files.

USB, DATA TRANSFERS FROM THE COMPACTFLASH CARD

WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

In order to transfer data from the CompactFlash card via the USB port, a driver must be installed on your computer. This driver is installed with Crimson and is located in the folder C:\Program Files\Red Lion Controls\Crimson 2.0\Device\ after Crimson is installed. This may have already been accomplished if your G315C was configured using the USB port.

Once the driver is installed, connect the G315C to your PC with a USB cable, and follow "Mounting the CompactFlash" instructions in the Crimson 2 user manual.

CABLES AND DRIVERS

Red Lion has a wide range of cables and drivers for use with many different communication types. A list of these drivers and cables along with pin outs is available from Red Lion's website. New cables and drivers are added on a regular basis. If making your own cable, refer to the "G315C Port Pin Outs" for wiring information.

ETHERNET COMMUNICATIONS

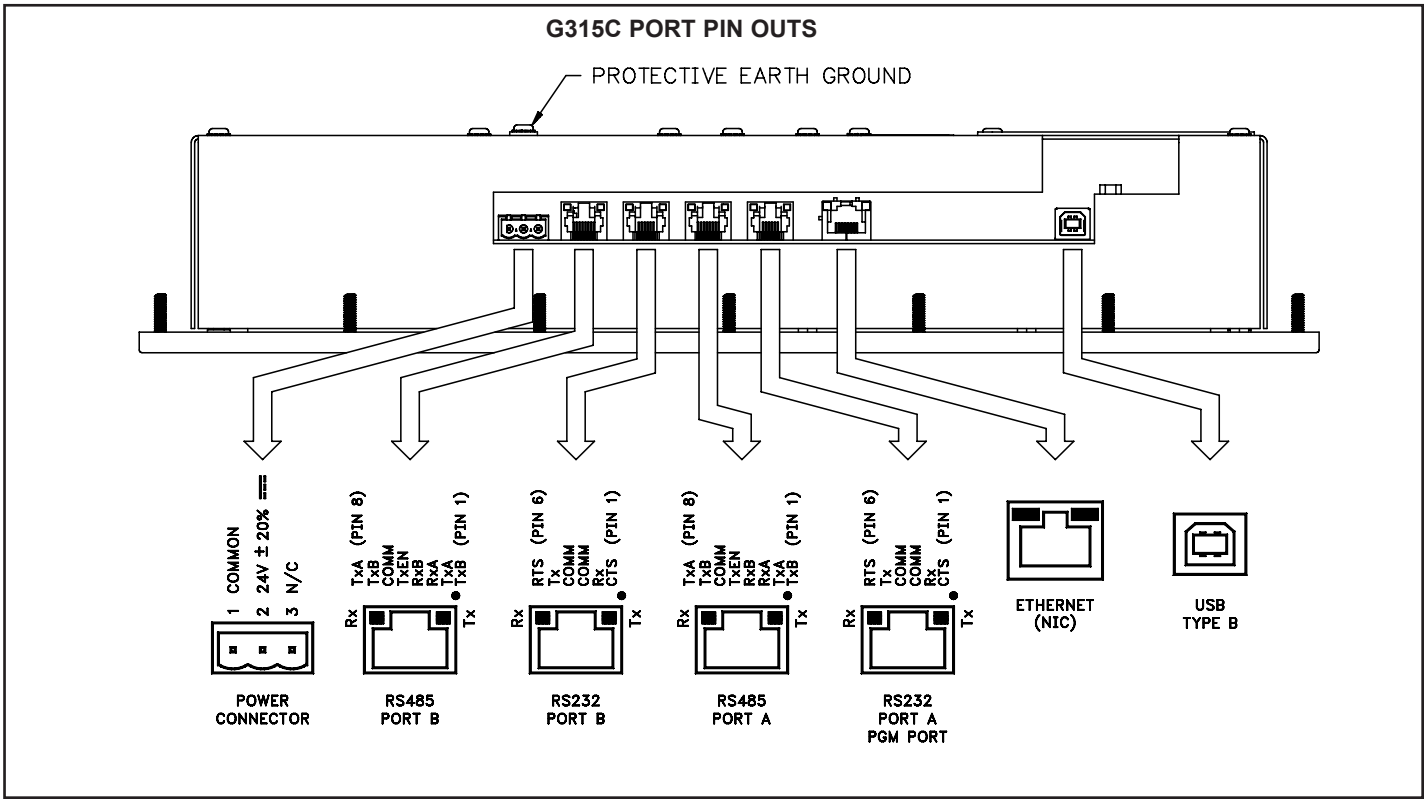
Ethernet communications can be established at either 10 BASE-T or 100 BASE-TX. The G315C unit's RJ45 jack is wired as a NIC (Network Interface Card). For example, when wiring to a hub or switch use a straight-through cable, but when connecting to another NIC use a crossover cable.

The Ethernet connector contains two LEDs. A yellow LED in the upper right, and a bi-color green/amber LED in the upper left. The LEDs represent the following statuses:

LED COLOR	DESCRIPTION
YELLOW solid	Link established.
YELLOW flashing	Data being transferred.
GREEN	10 BASE-T Communications
AMBER	100 BASE-TX Communications

On the rear of each unit is a unique 12-digit MAC address and a block for marking the unit with an IP address. Refer to the Crimson manual and Red Lion's website for additional information on Ethernet communications.

WIRING THE G315C



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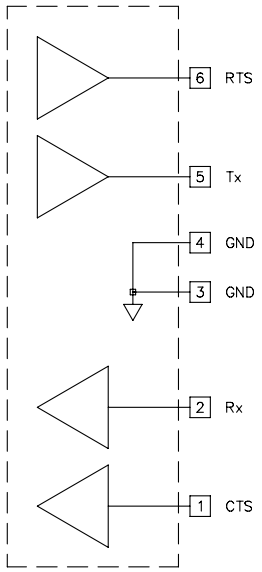
RS232 PORTS

The G315C has two isolated RS232 ports. The port marked "RS232/PORT A/PGM PORT" may be used for programming as well as communications, while the port marked RS232/PORT B may only be used for communications.

Both ports can be used for either master or slave protocols.

RS232 CONNECTIONS

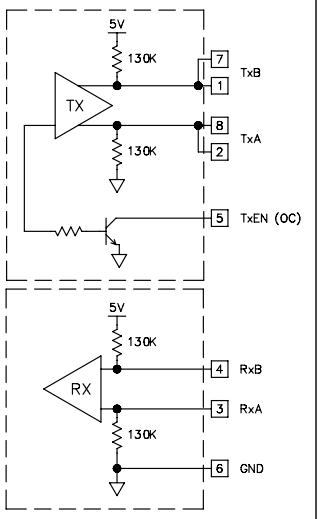


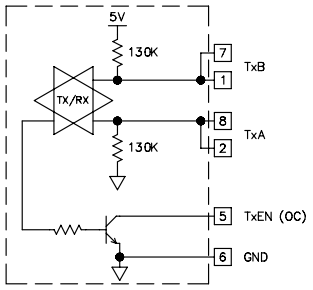
RS422/485 COMMS PORT

The G315C has two isolated RS422/485 ports. These ports can be configured to act as either RS422 or RS485.

RS422/485 4-WIRE CONNECTIONS

RS485 2-WIRE CONNECTIONS





***Note**: All Red Lion devices connect A to A and B to B, except for Paradigm devices. Refer to www.redlion.net for additional information.*

Examples of RS485 2-Wire Connections

G3 to Red Lion RJ11 (CBLRLC00) DLC, IAMS, ITMS, PAXCDC4C

Connections			
G3: RJ45	Name	RLC: RJ11	Name
5	TxEN	2	TxEN
6	COM	3	COM
1	TxB	5	B-
2	TxA	4	A+

G3 to Modular Controller (CBLRLC05)

Connections			
G3	Name	Modular Controller	Name
1,4	TxB	1,4	TxB
4,1	RxB	4,1	RxB
2,3	TxA	2,3	TxA
3,2	RxA	3,2	RxA
5	TxEN	5	TxEN
6	COM	6	COM
7	TxB	7	TxB
8	TxA	8	TxA

DH485 Connections

The G315C's RS422/485 COMMS port can also be used for Allen Bradley DH485 communications.

WARNING: **DO NOT** use a standard DH485 cable to connect this port to Allen Bradley equipment. A cable and wiring diagram are available from Red Lion.

G3 to AB SLC 500 (CBLAB003)

Connections			
RJ45: RLC	Name	RJ45: A-B	Name
1	TxB	1	A
2	TxA	2	B
3, 8	RxA	-	24V
4, 7	RxB	-	COMM
5	TxEN	5	TxEN
6	COMM	4	SHIELD
4, 7	TxB	-	COMM
3, 8	TxA	-	24V

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SOFTWARE/UNIT OPERATION

CRIMSON SOFTWARE

Crimson software is available as a free download from Red Lion's website or it can be purchased on a CD, see "Ordering Information" for part number. The latest version of the software is always available from the website, and updating your copy is free.

DISPLAY

This operator interface uses a liquid crystal display (LCD) for displaying text and graphics. The display utilizes a cold cathode fluorescent tube (CCFL) for lighting the display. The CCFL tubes can be dimmed for low light conditions.

These CCFL tubes have a limited lifetime. Backlight lifetime is based upon the amount of time the display is turned on at full intensity. Turning the backlight off when the display is not in use can extend the lifetime of your backlight. This can be accomplished through the Crimson software when configuring your unit.

KEYPAD

The G315C keypad consists of ten keys that can be used for on-screen menus.

TOUCHSCREEN

This operator interface utilizes a resistive analog touchscreen for user input. The unit will only produce an audible tone (beep) when a touch on an active touchscreen cell is sensed. The touchscreen is fully functional as soon as the operator interface is initialized, and can be operated with gloved hands.

TROUBLESHOOTING YOUR G315C

If for any reason you have trouble operating, connecting, or simply have questions concerning your new G315C, contact Red Lion's technical support. For contact information, refer to the back page of this bulletin for phone and fax numbers.

EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net
General Troubleshooting Tech Note:
http://www.redlion.net/TechNotes/TN0135.html

FRONT PANEL LEDS

There are three front panel LEDs. Shown below is the default status of the LEDs.

LED	INDICATION
GREEN (TOP, LABELED "PWR")	
FLASHING	Unit is in the boot loader, no valid configuration is loaded.[1]
STEADY	Unit is powered and running an application.
YELLOW (MIDDLE)	
OFF	No CompactFlash card is present.
STEADY	Valid CompactFlash card present.
FLASHING RAPIDLY	CompactFlash card being checked.
FLICKERING	Unit is writing to the CompactFlash, either because it is storing data, or because the PC connected via the USB port has locked the drive.[2]
FLASHING SLOWLY	Incorrectly formatted CompactFlash card present.
GREEN (BOTTOM)	
FLASHING	A tag is in an alarm state.
STEADY	Valid configuration is loaded and there are no alarms present.

1. The operator interface is shipped without a configuration. After downloading a configuration, if the light remains in the flashing state continuously, try cycling power. If the LED still continues to flash, try downloading a configuration again.
2. Do not turn off power to the unit while this light is flickering. The unit writes data in two minute intervals. Later Microsoft operating systems will not lock the drive unless they need to write data; Windows 98 may lock the drive any time it is mounted, thereby interfering with logging. Refer to "Mounting the CompactFlash" in the Crimson 2 User Manual.

BATTERY & TIME KEEPING

WARNING - EXPLOSION HAZARD - THE AREA MUST BE KNOWN TO BE NON-HAZARDOUS BEFORE SERVICING/ REPLACING THE UNIT AND BEFORE INSTALLING OR REMOVING I/O WIRING AND BATTERY.

WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN DISCONNECTED AND THE AREA IS KNOWN TO BE NON-HAZARDOUS.

A battery is used to keep time when the unit is without power. Typical accuracy of the G315C time keeping is less than one minute per month drift. The battery of a G315C unit does not affect the unit's memory, all configurations and data is stored in non-volatile memory.

CAUTION: RISK OF ELECTRIC SHOCK
The inverter board, attached to the mounting plate, supplies the high voltage to operate the backlight. Touching the inverter board may result in injury to personnel.

CAUTION: The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

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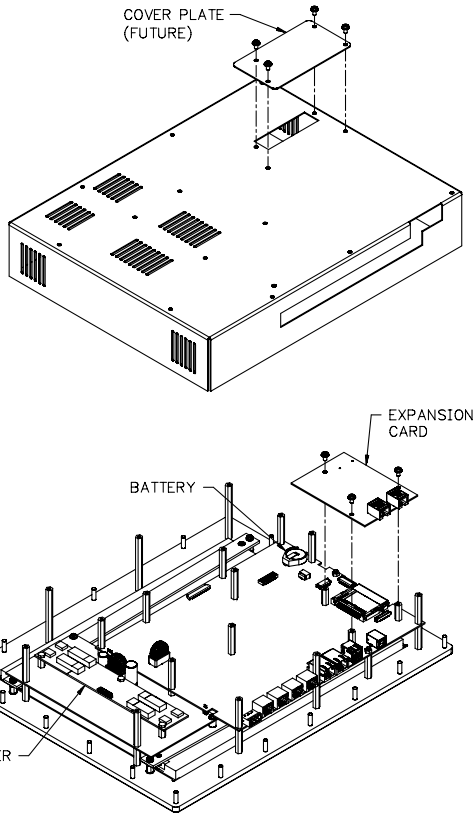
To change the battery of a G315C, remove power, cabling, and then the rear cover of the unit. To remove the cover, remove the 16 screws on the rear of the unit. Then, by lifting the top side, hinge the cover, thus providing clearance for the connectors on the bottom side of the PCB as shown in the illustration below. Install in the reverse manner.

Remove the old battery* from the holder and replace with the new battery. Replace the rear cover, cables, and re-apply power. Using Crimson or the unit's keypad, enter the correct time and date.

** Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. Also, the battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents come into contact with human skin.*

The battery used by the G315C is a lithium type CR2025.



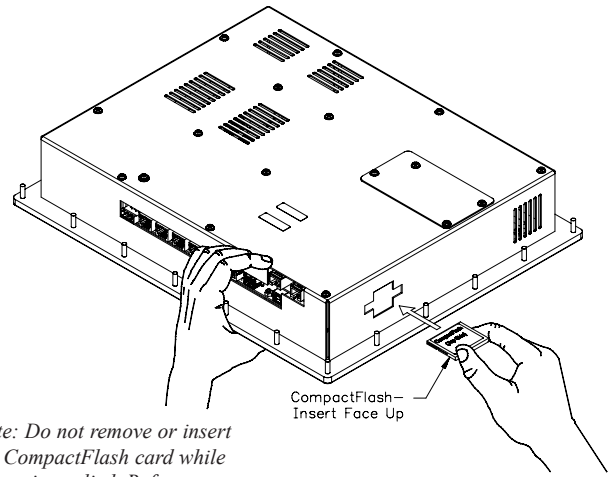
Optional Features and Accessories

COMPACTFLASH SOCKET

CompactFlash socket is a Type II socket that can accept either Type I or II cards. Use cards with a minimum of 4Mbytes with the G315C's CompactFlash socket. Cards are available at most computer and office supply retailers.

CompactFlash can be used for configuration transfers, larger configurations, data logging, and trending.

Information stored on a CompactFlash card by a G315C can be read by a card reader attached to a PC. This information is stored in IBM (Windows®) PC compatible FAT16 file format.



Note: Do not remove or insert the CompactFlash card while power is applied. Refer to "Front Panel LEDs."

NOTE

For reliable operation in all of our products, Red Lion recommends the use of SanDisk® and SimpleTech brands of CompactFlash cards.

Industrial grade versions that provide up to two million write/erase cycles minimum are available from Red Lion.

OPTIONAL COMMUNICATION CARD

Red Lion offers optional communication cards for fieldbus communications. These communication cards will allow your G315C to communicate with many of the popular fieldbus protocols.

Red Lion is also offering a communications card for additional RS232 and RS422/485 communications. Visit Red Lion's website for information and availability of these cards.

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LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

No warranties expressed or implied are created with respect to The Company's products except those expressly contained herein. The Customer acknowledges the disclaimers and limitations contained herein and relies on no other warranties or affirmations.

Red Lion Controls
20 Willow Springs Circle
York PA 17406
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839

Red Lion Controls BV
Printerweg 10
NL - 3821 AD Amersfoort
Tel +31 (0) 334 723 225
Fax +31 (0) 334 893 793

Red Lion Controls AP
31, Kaki Bukit Road 3,
#06-04/05 TechLink
Singapore 417818
Tel +65 6744-6613
Fax +65 6743-3360

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com

Tel +1 (717) 767-6511
Fax +1 (717) 764-0839
www.redlion.net

Bulletin No. G304K-A(1)
Drawing No. LP0771
Released 11/08

MODEL G304K - KADET OPERATOR INTERFACE WITH TFT DISPLAY

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- *CONFIGURED USING CRIMSON® 2.0 SOFTWARE*
- *TWO SERIAL COMMUNICATIONS PORTS (1 RS-232 AND 1 RS-232/422/485)*
- *UNIT'S CONFIGURATION IS STORED IN NON-VOLATILE FLASH MEMORY*
- *BRIGHT 4.3-INCH TFT ACTIVE MATRIX 256 COLOR 480 x 272 PIXEL DISPLAY*
- *THREE FRONT PANEL LED INDICATORS*
- *NEMA 4/IP65 FRONT PANEL*
- *POWER UNIT FROM 12-28 VDC*
- *RESISTIVE ANALOG TOUCHSCREEN*

CE

GENERAL DESCRIPTION

The 4.3-inch G3 Kadet was designed for applications in which available mounting space is at a premium. Though diminutive in size, the Kadet boasts a bright TFT display with full 256-color support. With a resolution of 480 x 272, the Kadet's 4.3-inch display has a higher resolution and better image clarity than most 6-inch HMIs.

The G3 Kadet offers two high-speed serial ports in the form of one RS-232 and one RS-232/422/485 ports. This allows the Kadet to simultaneously communicate with devices from different manufacturers, as well as to perform protocol conversion.

The G3 Kadet range of HMIs is programmed with Red Lion's free Crimson 2.0 software. Crimson 2.0 offers easy to use drag and drop communications configuration, while the embedded image library allows the programmer to create intuitive screens and prompts for the operator.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the unit.

CAUTION: Risk Of Danger.
Read complete instructions prior to installation and operation of the unit.

CAUTION: Risk of electric shock.

CONTENTS OF PACKAGE

- G304K Operator Interface.
- Hardware packet for mounting unit into panel.
- Terminal block for connecting power.
- Spare fuse.

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
G304K	4.3" TFT Operator Interface	G304K000
SFCRM2	Crimson 2.0 [1]	SFCRM200
CBL	USB to RS-232 Adaptor, includes "y" cable (CBLSK000)	CBLUSB23
	Communications Cables and Adaptor [2]	CBLxxxxx
G3FILM	Protective Film	G3FILM4K
	Fuse	G3FUSE00

[1] Use this part number to purchase the Crimson software on CD with a printed manual and cables for the G3 and Kadet series HMIs. Otherwise, download for free from www.redlion.net.

[2] Contact your Red Lion distributor or visit our website for selection of adapters and cables.

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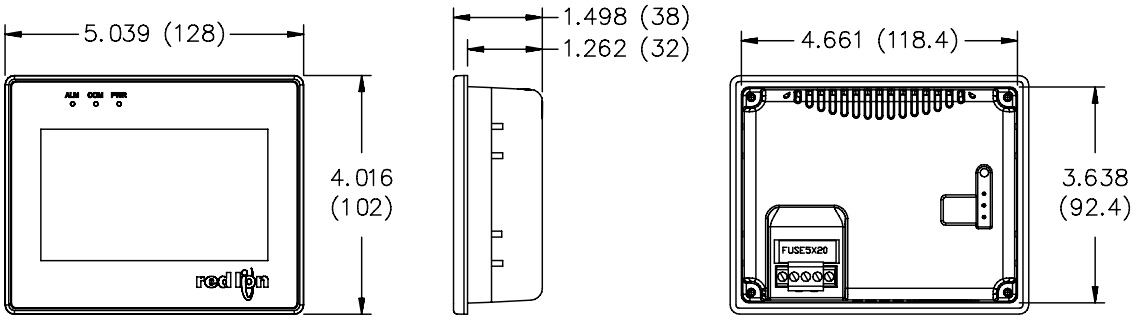
SPECIFICATIONS

1. **POWER REQUIREMENTS**:
   Must use Class 2 or SELV rated power supply.
   Power connection via removable three position terminal block.
   Supply Voltage: 12-28 VDC, Class 2
   Maximum Power: 3.6 W; Start up current may be as high as 700 mA
   Fused: Fast-blow 800mA, 5x20mm
2. **LCD DISPLAY**:

SIZE	4.3-inch
TYPE	TFT
COLORS	256
PIXELS	480 X 272
BRIGHTNESS	300 cd/m^2
BACKLIGHT TYPE	LED
BACKLIGHT LIFE	50,000 HR TYP.

3. **TOUCHSCREEN**: Four-wire resistive analog
4. **MEMORY**: 2MB of non-volatile flash memory
5. **COMMUNICATIONS**: Two Serial Ports - One RS-232 port, one RS-232/422/485
   Serial Ports: Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
6. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: 0 to 45°C
   Operating and Storage Humidity: 10-90% relative humidity (non-condensing) from 0 to 45°C.
   Vibration: Operational 10 to 25 Hz in X, Y, Z direction for 30 minutes, 2 g's.
7. **CERTIFICATIONS AND COMPLIANCES**:
   SAFETY
   UL Listed, File #E302106, UL508, CSA-C22.2 No. 142
   LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
   UL Type 4 Indoor Use Only Enclosure rating (Face only), UL50
   IP65 Enclosure rating (Face only), IEC 529
   ELECTROMAGNETIC COMPATIBILITY
   Consult factory for EMC specifications
8. **CONNECTIONS**: Compression cage-clamp terminal block.
   Wire Gage: 12-28 AWG copper wire
   Communications: DB9M connection
9. **CONSTRUCTION**: Plastic enclosure with NEMA 4/IP65 front panel when properly installed.
10. **WEIGHT**: 9.4 oz (270 g)

DIMENSIONS In inches (mm)

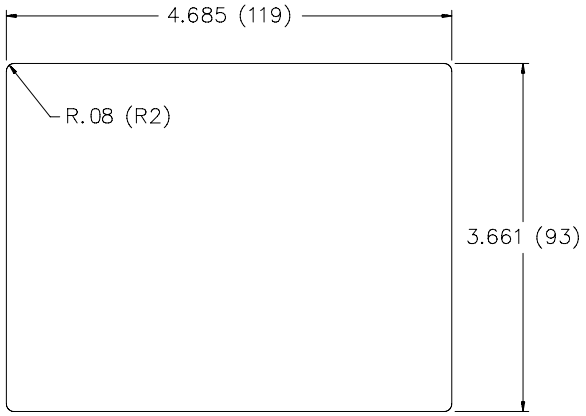


INSTALLING AND POWERING THE G304K

MOUNTING INSTRUCTIONS

The unit can be mounted into enclosures with a depth of 4". It is recommended that the unit be mounted on the front panel of a steel enclosure. Allow clearance of 1" around the sides of the unit for the mounting hardware.

Place the unit in the panel cutout. Slide clamps into the four holes provided at the top and bottom of the case. Tighten the clamping screws in an even pattern until the unit is secured in the panel. Caution: Do not over tighten the clamps. To seal to NEMA4 specifications, all supplied mounting clamps must be used. The panel must not flex more than 0.010".



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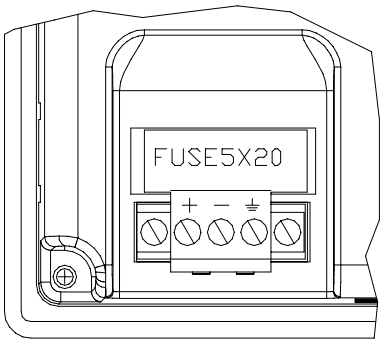
POWER SUPPLY REQUIREMENTS

The G304K requires a 12-28 VDC power supply. Please take care to observe the following points:

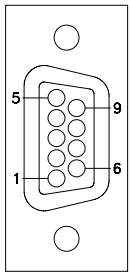
- The wire used to connect the operator interface's power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
- A power supply with a Class 2 or SELV rating is to be used. A Class 2 or SELV power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for "safety extra-low voltage." Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.



COMMUNICATING WITH THE G304K

The G304K has two serial ports combined into a single DB9-M connector.

PC (RS-232)

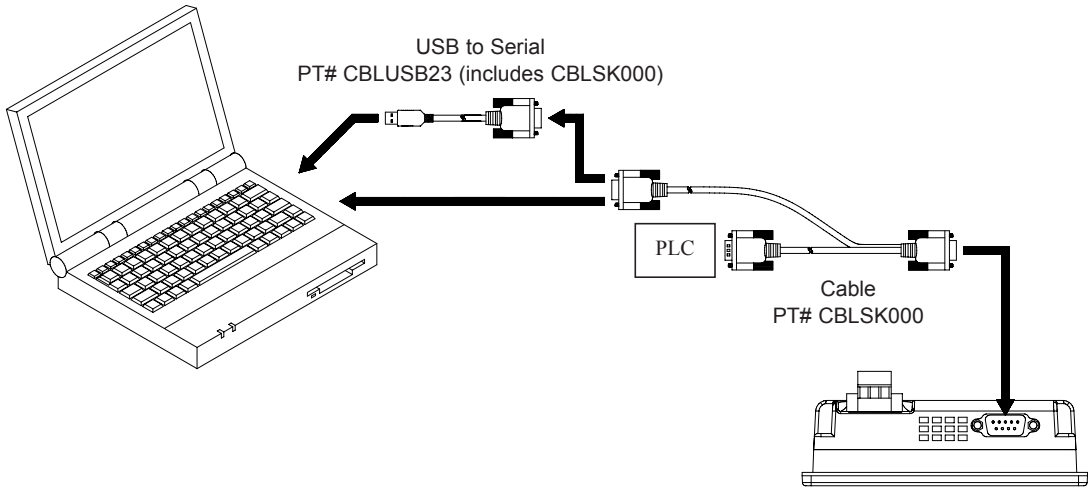


DB9-M

PIN	SYMBOL	PLC (RS-485) 4 wire	PLC (RS-485) 2 wire	PLC (RS-232)	PC (RS-232)
1	Rx-	Rx-	Data-		
2	Rx+	Rx+	Data+		
3	Tx-	Tx-			
4	Tx+	Tx+			
5	GND	Signal Ground			
6	TxD			Transmit	
7	TxD				Transmit
8	RxD				Receive
9	RxD			Receive	

PC CONNECTION

Configuration files are downloaded to the Kadet via the PC port, which can be connected to a computer via various cables.



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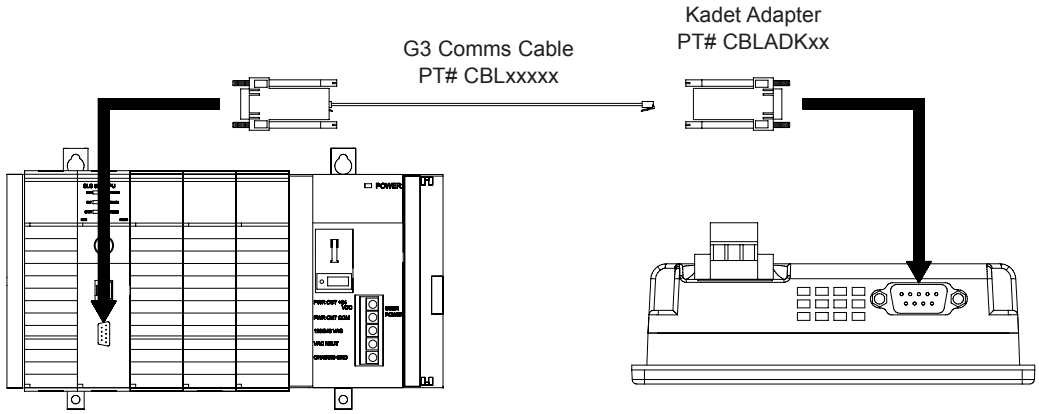
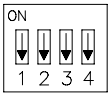
DEVICE COMMUNICATIONS

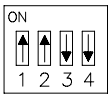
Several adapters are available which allow direct connection via Red Lion communications cables. For a list of adapters and cables, please visit http://www.redlion.net/support/downloads.html.



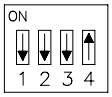
SETTING THE SWITCHES



Normal mode.



Cycle power or press reset button with the switches as shown in order to display the Clear Database prompt. Touch the left side of the display to clear the database; touch the right side to continue in normal mode.



Lowers the intensity of the backlight.

SOFTWARE/UNIT OPERATION

CRIMSON SOFTWARE

Crimson software is available as a free download from Red Lion's website or it can be purchased on a CD, see "Ordering Information" for part number. The latest version of the software is always available from the website, and updating your copy is free.

FRONT PANEL LEDS

There are three front panel LEDs. Shown below is the default status of the LEDs.

LED	INDICATION
RED (ALM)	
FLASHING	Tag is in an alarm condition and not acknowledged
STEADY	Acknowledged alarm exists.
FLASHING RAPIDLY	In conjunction with green com LED while unit is in bootloader
GREEN (COM)	
OFF	Communications not established
STEADY	No communication errors are present
FLASHING RAPIDLY	In conjunction with the red ALM LED while the unit is in bootloader.
FLICKERING	Communication error exists
ORANGE (PWR)	
STEADY	Power is applied.

TOUCHSCREEN

This operator interface utilizes a resistive analog touchscreen for user input. The unit will only produce an audible tone (beep) when a touch on an active touchscreen cell is sensed. The touchscreen is fully functional as soon as the operator interface is initialized, and can be operated with gloved hands.

TROUBLESHOOTING YOUR G304K

If for any reason you have trouble operating, connecting, or simply have questions concerning your new G304K, contact Red Lion's technical support. For contact information, refer to the front page of this bulletin for phone and fax numbers.

EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net

CAUTION: The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

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Fax +1 (717) 764-0839
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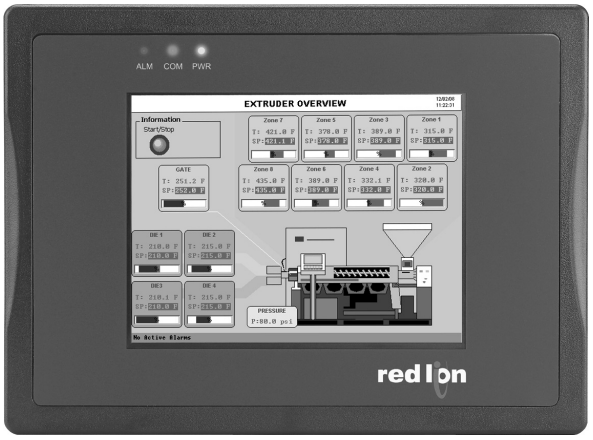
Bulletin No. G306K-A
Drawing No. LP0772
Released 11/08

MODEL G306K - G3 KADET OPERATOR INTERFACE WITH 5.6" TFT DISPLAY



- *CONFIGURED USING CRIMSON® 2.0 SOFTWARE*
- *THREE SERIAL COMMUNICATIONS PORTS (1 RS-232 AND 2 RS-232/422/485 PORTS)*
- *10 BASE-T ETHERNET PORT COMMUNICATES WITH UP TO FOUR PROTOCOLS SIMULTANEOUSLY*
- *UNIT'S CONFIGURATION IS STORED IN NON-VOLATILE FLASH MEMORY*
- *COMPACTFLASH® SOCKET FOR LOADING DATABASE IN FIELD*
- *5.6-INCH TFT ACTIVE MATRIX 256 COLOR QVGA 320 X 234 PIXEL DISPLAY*
- *NEMA 4/IP65 FRONT PANEL*
- *THREE FRONT PANEL LED INDICATORS*
- *POWER UNIT FROM 12 - 24 VDC*
- *RESISTIVE ANALOG TOUCHSCREEN*

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CE

GENERAL DESCRIPTION

The G306K is the perfect solution for applications that require the operator to monitor and control more than just a single device. With three serial ports and an Ethernet port, the 5.6" Kadet can connect to multiple serial and Ethernet devices simultaneously, including PLCs, motor drives, bar code scanners, etc.

The G306K performs the functions of a multiple protocol converter, using three high-speed RS-232/422/485 communications ports and a 10 Base-T Ethernet port. The Ethernet port supports up to four protocols simultaneously, allowing dissimilar Ethernet based products to communicate with one another.

The CompactFlash slot can be used to load the unit's configuration file, allowing configuration changes to be made and saved to the card for later transfer.

The G3 Kadet range of HMIs is programmed with Red Lion's free Crimson 2.0 software. Crimson 2.0 offers easy to use drag and drop communications configuration, while the embedded image library allows the programmer to create intuitive screens and prompts for the operator.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the unit.

CAUTION: Risk Of Danger.
Read complete instructions prior to installation and operation of the unit.

CAUTION: Risk of electric shock.

CompactFlash is a registered trademark of CompactFlash Association.

CONTENTS OF PACKAGE

- G306K Operator Interface.
- Hardware packet for mounting unit into panel.
- Terminal block for connecting power.
- Spare fuse.

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
G306K	5.6" TFT Operator Interface	G306K000
G3CF	64 MB CompactFlash Card [4]	G3CF064M
	256 MB CompactFlash Card [4]	G3CF256M
	512 MB CompactFlash Card [4]	G3CF512M
SFCRM2	Crimson 2.0 [1]	SFCRM200
CBL	USB to RS-232 Adaptor, includes "y" cable (CBLSK000)	CBLUSB23
	Communications Cables and Adaptors [2]	CBLxxxxx
G3FILM	Protective Films	G3FILM6K
	Fuse	G3FUSE00
	Replacement Battery [3]	BNL30000

[1] Use this part number to purchase the Crimson® software on CD with a printed manual and cables for the G3 and Kadet series HMIs. Otherwise, download for free from www.redlion.net.
[2] Contact your Red Lion distributor or visit our website for selection of adapters and cables.
[3] Battery type is lithium coin type CR2032.
[4] Industrial grade two million write cycles.

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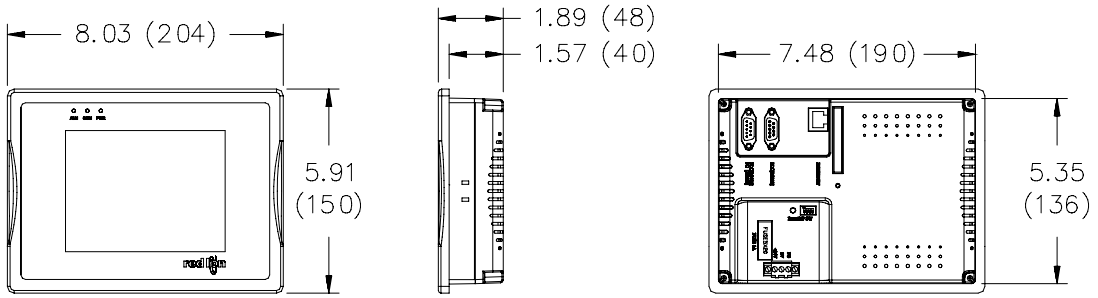
SPECIFICATIONS

1. **POWER REQUIREMENTS**:
   Must use Class 2 or SELV rated power supply.
   Power connection via removable three position terminal block.
   Supply Voltage: 12 - 24 VDC, Class 2
   Maximum Power: 200 mA @ 24 VDC
   Fuse: Fast-blow 800mA, 5x20mm
2. **BATTERY**: Lithium coin cell. Typical lifetime of 10 years.
3. **LCD DISPLAY**:

SIZE	5.6-inch
TYPE	TFT
COLORS	256
PIXELS	320 X 234
BRIGHTNESS	300 cd/m^2
BACKLIGHT TYPE	LED
BACKLIGHT LIFE	30,000 HR TYP.

4. **TOUCHSCREEN**: Four-wire resistive analog
5. **MEMORY**:
   On Board User Memory: 2 Mbyte of non-volatile Flash memory.
   Memory Card: CompactFlash Type II slot for Type I and Type II CompactFlash cards.
   Note: For reliable operation in all of our products, Red Lion recommends the use of SanDisk® and SimpleTech brands of CompactFlash cards. Industrial grade versions that provide up to two million write/erase cycles minimum are available from Red Lion.
6. **COMMUNICATIONS**: Three Serial Ports - One RS-232 port, two RS-232/422/485: One Ethernet Port
   Serial Ports: Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
   Ethernet Port: 10 Mbps
7. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: 0 to 45°C
   Operating and Storage Humidity: 10-90% relative humidity (non-condensing) from 0 to 45°C.
   Vibration: Operational 10 to 25 Hz, in X, Y, Z direction, 30 minutes, 2 g's.
8. **CERTIFICATIONS AND COMPLIANCES**:
   SAFETY
   UL Listed, File #E302106, UL508, CSA-C22.2 No. 142
   LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
   UL Type 4 Indoor Use Only Enclosure rating (Face only), UL50
   IP65 Enclosure rating (Face only), IEC 529
   ELECTROMAGNETIC COMPATIBILITY
   Consult factory for EMC specifications
9. **CONNECTIONS**: Compression cage-clamp terminal block.
   Wire Gage: 12-28 AWG copper wire
   Communications: DB9 connectors
10. **CONSTRUCTION**: Plastic enclosure with NEMA 4/IP65 front panel when properly installed.
11. **WEIGHT**: 30 oz. (850 g)

DIMENSIONS In inches (mm)

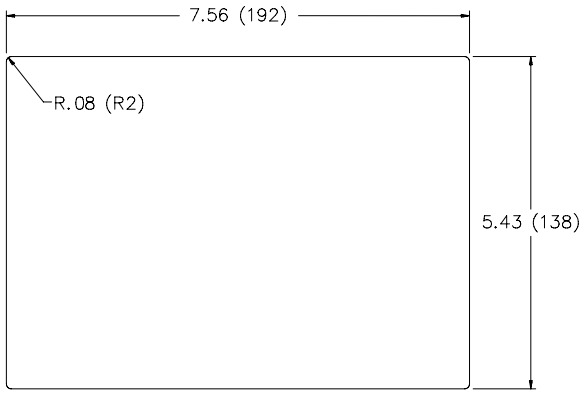


INSTALLING AND POWERING THE G306K

MOUNTING INSTRUCTIONS

The unit can be mounted into enclosures with a depth of 4". It is recommended that the unit be mounted on the front panel of a steel enclosure. Allow clearance of 1" around the sides of the unit for the mounting hardware.

Place the unit in the panel cutout. Slide clamps into the four holes provided at the top and bottom of the case. Tighten the clamping screws in an even pattern until the unit is secured in the panel. Caution: Do not over tighten the clamps. To seal to NEMA4 specifications, all supplied mounting clamps must be used. The panel must not flex more than 0.010".



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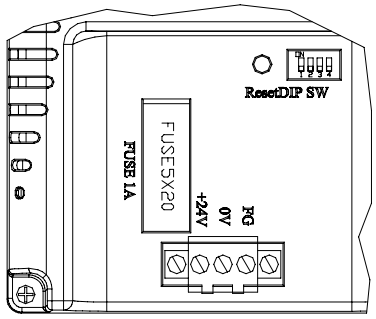
CONNECTING POWER

The G306K requires a 12-24 VDC power supply. Please take care to observe the following points:

- The wire used to connect the operator interface's power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
- A power supply with a Class 2 or SELV rating is to be used. A Class 2 or SELV power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for "safety extra-low voltage." Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.



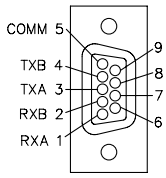
COMMUNICATING WITH THE G306K

The G306K has three serial ports, as well as an Ethernet port. The serial ports are exposed via one DB9 male, and one DB9 female connector. You may assign one unique protocol to each of the Programming, Comms and Auxiliary ports for a total of three different serial protocols.

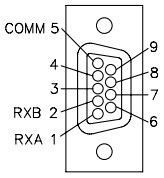
Note: If you assign a protocol to the Programming Port, you will no longer be able to download. You should create a means to call the StopSystem() function from the HMI touchscreen, such that the Programming Port activity can be halted on command. Alternatively, the HMI's memory can be cleared to restore download functionality.

The Ethernet port can be programmed to communicate via four protocols simultaneously. For more information on protocol support, please refer to the Crimson 2.0 programming software.

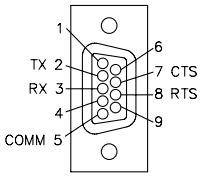
COMMS



RS-485 (4-wire)
DB9-M

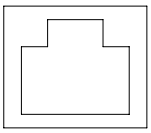


RS-485 (2-wire)
DB9-M

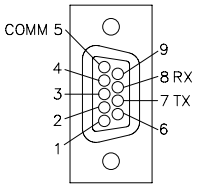


RS-232
DB9-F

RJ-45 Ethernet

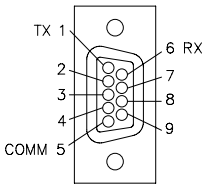


PROGRAMMING

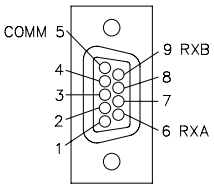


RS-232 PC
DB9-M

AUXILIARY



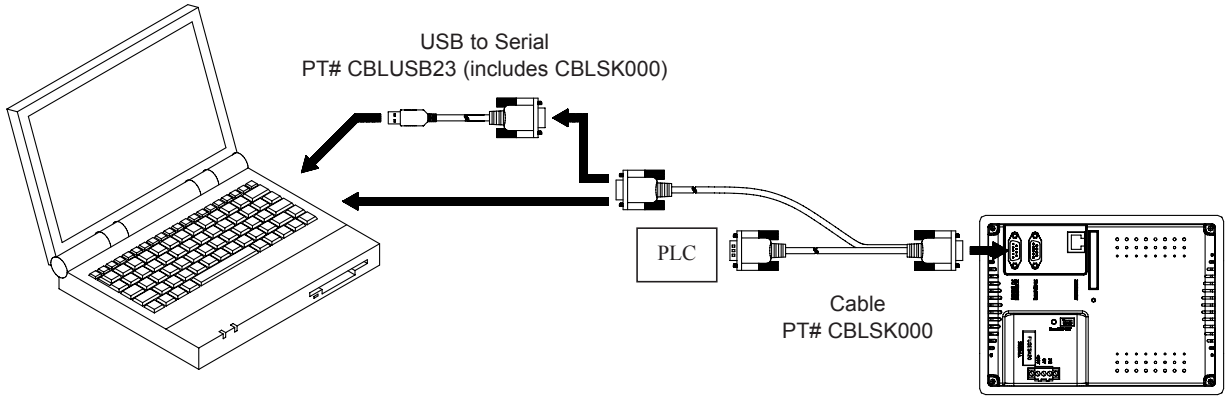
RS-232 AUX
DB9-F



RS-485 AUX
DB9-M

PC CONNECTION

Configuration files are downloaded to the Kadet via the PC port, which can be connected to a computer via various cables.



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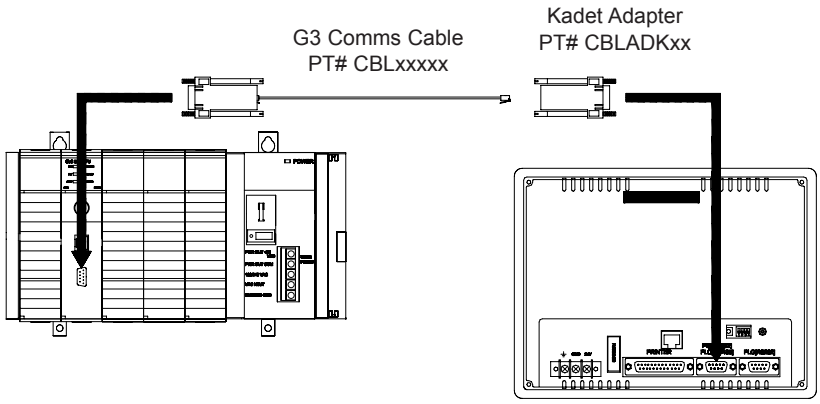
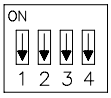
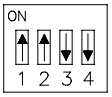
Several adapters are available which allow direct connection via Red Lion communications cables. For a list of adapters and cables, please visit http://www.redlion.net/support/downloads.html.



SETTING THE SWITCHES



Normal mode.



Cycle power with the switches as shown in order to display the Clear Database prompt. Touch the left side of the display to clear the database; touch the right side to continue in normal mode.

SOFTWARE/UNIT OPERATION

CRIMSON SOFTWARE

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FRONT PANEL LEDS

There are three front panel LEDs. Shown below is the default status of the LEDs.

LED	INDICATION
RED (ALM)	
FLASHING	Tag is in alarm condition and not acknowledged
SOLID	Acknowledged alarms exist
OFF	No alarms present
FLASHES RAPIDLY	In conjunction with Green COM LED when unit is in boot loader
GREEN (COM)	
STEADY	No communications errors are present
OFF	Comms are not established
FLICKERING	Comm error exists
FLASHES RAPIDLY	In conjunction with Red COM LED when unit is in boot loader
ORANGE (PWR)	
STEADY	Power is applied

TOUCHSCREEN

This operator interface utilizes a resistive analog touchscreen for user input. The unit will only produce an audible tone (beep) when a touch on an active touchscreen cell is sensed. The touchscreen is fully functional as soon as the operator interface is initialized, and can be operated with gloved hands.

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EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net

BATTERY REPLACEMENT

The G306K uses one CR2032 coin type lithium battery to maintain the RTC (real-time clock) and for proper Ethernet download operation. To change the battery, remove power, cabling, and then the rear cover of the unit. Remove the old battery from the holder and replace with a new battery*. Replace the rear cover, cables, and re-apply power. Set the RTC to the proper date and time.

** Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. Also, the battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents come into comtact with human skin.*

CAUTION: The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

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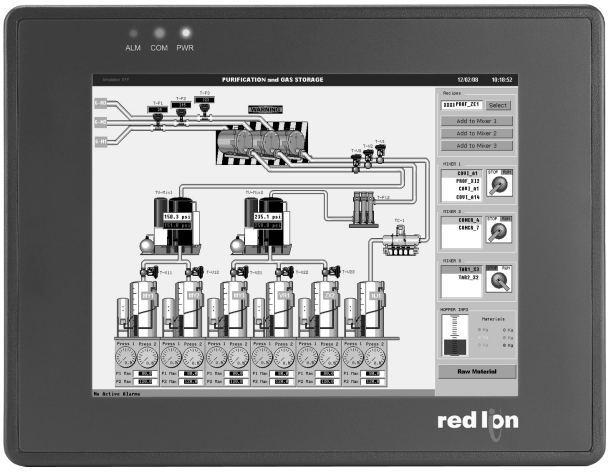
Tel +1 (717) 767-6511
Fax +1 (717) 764-0839
www.redlion.net

Bulletin No. G308K-A
Drawing No. LP0773
Released 11/08

MODEL G308K - G3 KADET OPERATOR INTERFACE WITH 8" TFT DISPLAY



- *CONFIGURED USING CRIMSON® 2.0 SOFTWARE*
- *THREE SERIAL COMMUNICATIONS PORTS (1 RS-232 AND 2 RS-232/422/485 PORTS)*
- *10 BASE-T ETHERNET PORT COMMUNICATES WITH UP TO FOUR PROTOCOLS SIMULTANEOUSLY*
- *UNIT'S CONFIGURATION IS STORED IN NON-VOLATILE FLASH MEMORY*
- *COMPACTFLASH® SOCKET FOR LOADING DATABASE IN FIELD*
- *8-INCH TFT ACTIVE MATRIX 256 COLOR VGA 640 X 480 PIXEL DISPLAY*
- *NEMA 4/IP65 FRONT PANEL*
- *THREE FRONT PANEL LED INDICATORS*
- *POWER UNIT FROM 24 VDC*
- *RESISTIVE ANALOG TOUCHSCREEN*

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GENERAL DESCRIPTION

The G308K is the perfect solution for applications that require the operator to monitor and control more than just a single device. With three serial ports and an Ethernet port, the 8" Kadet can connect to multiple serial and Ethernet devices simultaneously, including PLCs, motor drives, bar code scanners, etc.

The G308K performs the functions of a multiple protocol converter, using three high-speed RS-232/422/485 communications ports and a 10 Base-T Ethernet port. The Ethernet port supports up to four protocols simultaneously, allowing dissimilar Ethernet based products to communicate with one another.

The CompactFlash slot can be used to load the unit's configuration file, allowing configuration changes to be made and saved to the card for later transfer.

The G3 Kadet range of HMIs is programmed with Red Lion's free Crimson 2.0 software. Crimson 2.0 offers easy to use drag and drop communications configuration, while the embedded image library allows the programmer to create intuitive screens and prompts for the operator.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the unit.

CAUTION: Risk of Danger
Read complete instructions prior to installationand operation of the unit.

CAUTION: Risk of electric shock.

CompactFlash is a registered trademark of CompactFlash Association.

CONTENTS OF PACKAGE

- G308K Operator Interface.
- Hardware packet for mounting unit into panel.
- Spare fuse

ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBER
G308K	8" TFT Operator Interface	G308K000
G3CF	64 MB CompactFlash Card [4]	G3CF064M
	256 MB CompactFlash Card [4]	G3CF256M
	512 MB CompactFlash Card [4]	G3CF512M
SFCRM2	Crimson 2.0 [1]	SFCRM200
CBL	USB to RS-232 Adaptor, includes "y" cable (CBLSK000)	CBLUSB23
	Communications Cables and Adaptors [2]	CBLxxxxx
G3FILM	Protective Films	G3FILM8K
	Fuse	G3FUSE00
	Replacement Battery [3]	BNL30000

[1] Use this part number to purchase the Crimson® software on CD with a printed manual and cables for the G3 and Kadet series HMIs. Otherwise, download for free from www.redlion.net.
[2] Contact your Red Lion distributor or visit our website for selection of adapters and cables.
[3] Battery type is lithium coin type CR2032.
[4] Industrial grade two million write cycles.

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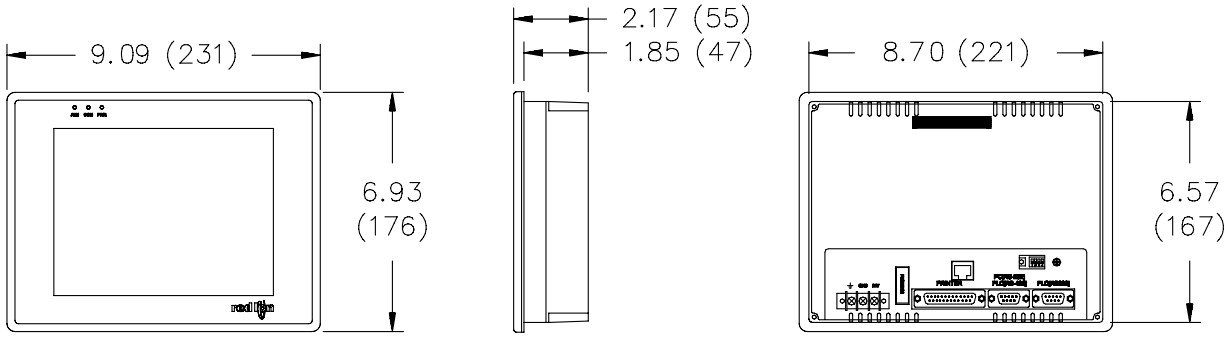
SPECIFICATIONS

1. **POWER REQUIREMENTS**:
   Must use Class 2 or SELV rated power supply.
   Power connection three position terminal block.
   Supply Voltage: 24 VDC ± 5%, Class 2
   Maximum Power: 440 mA @ 24 VDC
   Fuse: Fast-blow 800mA, 5x20mm
2. **BATTERY**: Lithium coin cell. Typical lifetime of 10 years.
3. **LCD DISPLAY**:

SIZE	8-inch
TYPE	TFT
COLORS	256
PIXELS	640 X 480
BRIGHTNESS	400 cd/m^2
BACKLIGHT TYPE	CCFL
BACKLIGHT LIFE	50,000 HR TYP.

4. **TOUCHSCREEN**: Four-wire resistive analog
5. **MEMORY**:
   On Board User Memory: 4 Mbyte of onboard non-volatile Flash memory.
   Memory Card: CompactFlash Type II slot for Type I and Type II CompactFlash cards.
   Note: For reliable operation in all of our products, Red Lion recommends the use of SanDisk® and SimpleTech brands of CompactFlash cards. Industrial grade versions that provide up to two million write/erase cycles minimum are available from Red Lion.
6. **COMMUNICATIONS**: Three Serial Ports - One RS-232 port, two RS-232/422/485: One Ethernet Port
   Serial Ports: Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
   Ethernet Port: 10 Mbps
7. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: 0 to 45°C
   Operating and Storage Humidity: 10-90% relative humidity (non-condensing) from 0 to 45°C.
   Vibration: Operational 10 to 25 Hz, in X, Y, Z direction for 30 minutes, 2 g's.
8. **CERTIFICATIONS AND COMPLIANCES**:
   SAFETY
   UL Listed, File #E302106, UL508, CSA-C22.2 No. 142
   LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
   UL Type 4 Indoor Use Only Enclosure rating (Face only), UL50
   IP65 Enclosure rating (Face only), IEC 529
   ELECTROMAGNETIC COMPATIBILITY
   Consult factory for EMC specifications
9. **CONNECTIONS**: Screw terminal block.
   Wire Gage: 12-28 AWG copper wire
   Communications: DB9 Connectors
10. **CONSTRUCTION**: Plastic enclosure with NEMA 4/IP65 front panel when properly installed
11. **WEIGHT**: 42.4 oz (1.2 g)

DIMENSIONS In inches (mm)

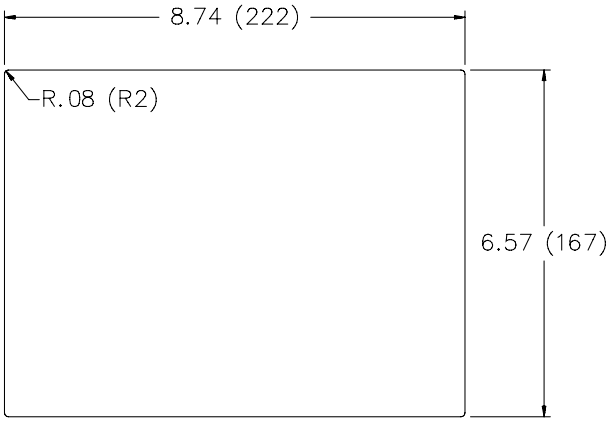


INSTALLING AND POWERING THE G308K

MOUNTING INSTRUCTIONS

The unit can be mounted into enclosures with a depth of 4". It is recommended that the unit be mounted on the front panel of a steel enclosure. Allow clearance of 1" around the sides of the unit for the mounting hardware.

Place the unit in the panel cutout. Slide clamps into the four holes provided at the top and bottom of the case. Tighten the clamping screws in an even pattern until the unit is secured in the panel. Caution: Do not over tighten the clamps. To seal to NEMA4 specifications, all supplied mounting clamps must be used. The panel must not flex more than 0.010".



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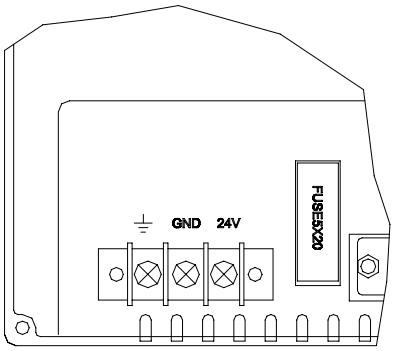
CONNECTING POWER

The G308K requires a 24 VDC ± 5% power supply. Please take care to observe the following points:

- The wire used to connect the operator interface's power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
- A power supply with a Class 2 or SELV rating is to be used. A Class 2 or SELV power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for "safety extra-low voltage." Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.



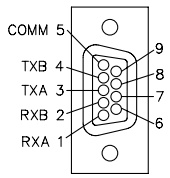
COMMUNICATING WITH THE G308K

The G308K has three serial ports, as well as an Ethernet port. The serial ports are exposed via one DB9 male, and one DB9 female connector. You may assign one unique protocol to each of the Programming, Comms and Auxiliary ports for a total of three different serial protocols.

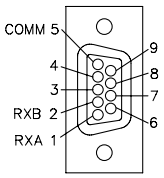
Note: If you assign a protocol to the Programming Port, you will no longer be able to download. You should create a means to call the StopSystem() function from the HMI touchscreen, such that the Programming Port activity can be halted on command. Alternatively, the HMI's memory can be cleared to restore download functionality.

The Ethernet port can be programmed to communicate via four protocols simultaneously. For more information on protocol support, please refer to the Crimson 2.0 programming software.

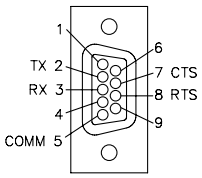
COMMS



RS-485 (4-wire)
DB9-M

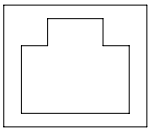


RS-485 (2-wire)
DB9-M

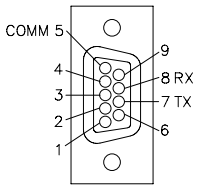


RS-232
DB9-F

RJ-45 Ethernet

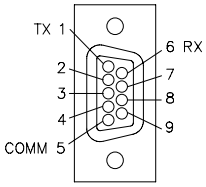


PROGRAMMING

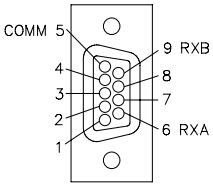


RS-232 PC
DB9-M

AUXILIARY



RS-232 AUX
DB9-F



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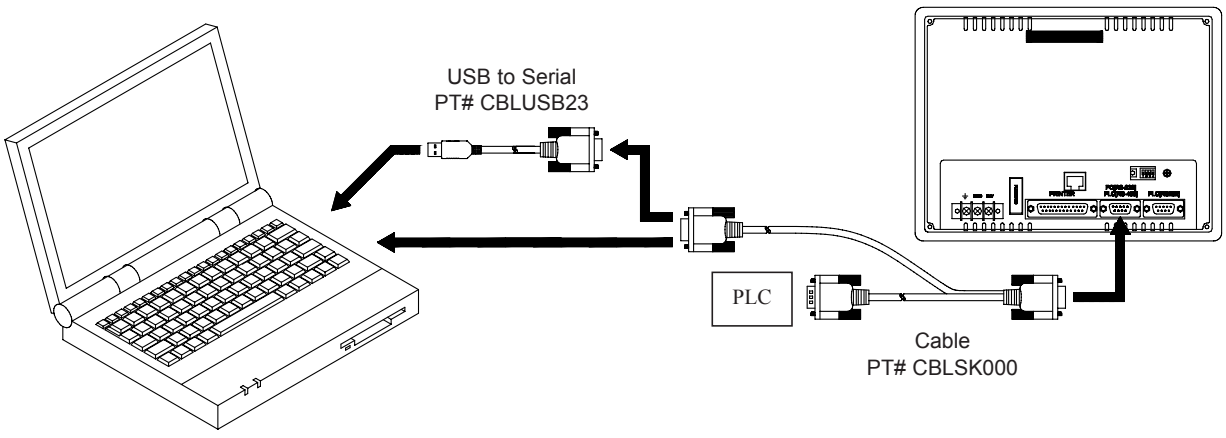

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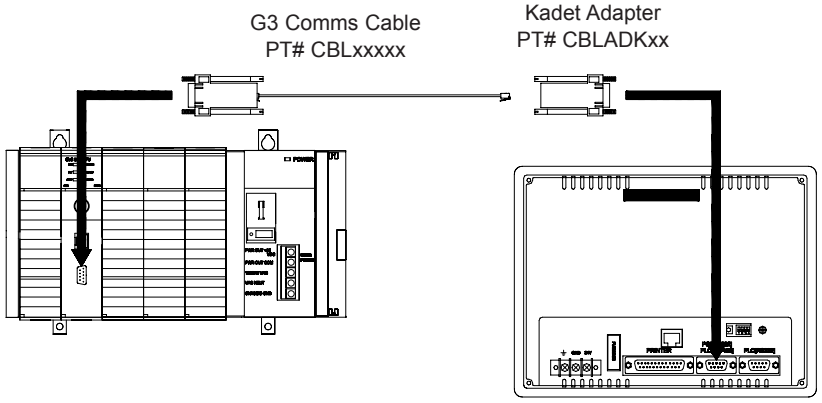

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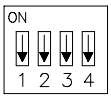

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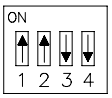

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** Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. Also, the battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents come into comtact with human skin.*

CAUTION: RISK OF ELECTRIC SHOCK
The inverter board, attached to the mounting plate, supplies the high voltage to operate the backlight. Touching the inverter board may result in injury to personnel.

CAUTION: The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

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